REQUEST FOR PROPOSALS

TO PROVIDE

CONSTRUCTION MANAGEMENT SERVICES

FOR THE

BLAIRS LANE BRIDGE REPLACEMENT PROJECT

PROJECT No. 40604

RELEASE DATE: April 23, 2015

CITY OF PLACERVILLE
Engineering Division
3101 Center Street
Placerville, CA 95667

www.cityofplacerville.org

Telephone: (530) 642-5250
City Engineer: Rebecca Neves, P.E.

City of Placerville
Engineering Division
3101 Center Street, Placerville, CA 95667
Ph. (530) 642-5250 Fx. (530) 642-5568

April 23, 2015

TO: Qualified Engineering Consultants

SUBJECT: **REQUEST FOR PROPOSALS NOTICE**
BLAIRS LANE BRIDGE REPLACEMENT PROJECT (CIP 40604)
CONSTRUCTION MANAGEMENT SERVICES

Dear Qualified Civil Engineering Consultant:

Notice is hereby given that Proposals will be received by the City of Placerville until **Wednesday, May 14, 2015 at 4:00 P.M.** local time for furnishing all labor, materials and equipment, and performing all work necessary and incidental to:

> **Provide construction management services including Resident Engineer, inspection, materials testing, construction staking, coordination of environmental monitoring, and contract administration services** for the **Blairs Lane Bridge Replacement Project,** a project to replace the existing single lane bridge with a two lane bridge over Hangtown Creek.
>
> Construction work will include demolition of the existing bridge and construction of the new two lane bridge with sidewalks including retaining walls and storm drain facilities, relocation of sewer and water facilities, and roadway reconstruction from the intersection of Baco Drive to Broadway.

Proposals shall be addressed to:

> City of Placerville
> Engineering Division
> 3101 Center Street
> Placerville, CA 95667
>
> Attn: Rebecca Neves, P.E.
> City Engineer

Consultants wishing to propose in response to this RFP are invited to attend the **mandatory pre-proposal conference** scheduled for Wednesday, May 6th, 2015, 1 p.m. in the 3rd Floor Conference Room at City Hall, 3101 Center Street. The City will mail any addenda to the RFP directly to the Consultants who attend the meeting.

Questions shall be addressed to Ms. Rebecca Neves in writing according to the timelines indicated herein and at the address indicated above. Oral explanation or instructions shall not be considered binding by the City of Placerville. Any modifications to this solicitation will be issued by the City of Placerville in the form of written addenda as indicated above.

City of Placerville
Engineering Division
3101 Center Street, Placerville, CA 95667
Ph. (530) 642-5250 Fx. (530) 642-5568

This RFP does not commit the City of Placerville to award a contract or pay any costs associated with the preparation of a proposal. The City of Placerville reserves the right to cancel this solicitation at any time or to extend the submittal deadline.

Sincerely,

Rebecca Neves, P.E.
City Engineer
(530) 642-5250

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1. INTRODUCTION

The City of Placerville (City) is soliciting Proposals from qualified firms (Proposer) to provide professional Resident Engineer, inspection, materials testing, construction staking, environmental monitoring coordination, and contract administration services for the **Blairs Lane Bridge Replacement (Project)**. Major elements of the project include the following:

- Construction of a new 2-lane single span prestressed bridge on spread footings over Hangtown Creek
- Demolition of the existing 1-lane bridge over Hangtown Creek
- Relocation of existing sewer facilities from Hangtown Creek to Broadway
- Construction of a new pressure reducing station (PRV) and connections to existing water mains
- Construction of new curbs, gutters and sidewalks on the West side of Blairs lane from Broadway to Baco Drive
- Construction of new curbs, gutters and sidewalks on the East side of Blairs lane from Broadway to the south side of the new bridge with new curb and gutter continuing south to Baco Drive
- Construction of one (1) Type 5 (Mod) Retaining Wall
- Construction of one (1) Type 5 Retaining Wall
- Construction of two (2) Modular Block Retaining Walls
- Roadway paving
- Staged Construction

Federal funds will be used for construction and construction management (CM) of the project through the Highway Bridge Program (HBP) with additional funding for ineligible items from Lakemont Village Placerville, LLC. Proposer should be familiar with administering projects with federal funds.

The project is located on Blairs Lane from Broadway to Baco Drive. The City of Placerville is the lead agency for the project under a Cooperative Agreement with the State of California Department of Transportation (Caltrans).

A location map with project layout is attached as **Attachment A**. Project 100% Not For Construction Plans and Specifications are located in Attachments E and F respectively.

The City will hold a **mandatory pre-proposal meeting** on Wednesday, May 6th, 2015 at 1:00 p.m. in the 3rd Floor Conference Room at City Hall, 3101 Center Street, Placerville, CA 95667 to provide project information and answer any questions regarding this Request for Proposals (RFP). Proposals will not be considered unless the consultant has attended the pre-proposal meeting.

It is the intent of the City to have the Project constructed in accordance with the project plans and specifications prepared for the Project. The tentative project schedule is as follows:

- Award CM Contract – June 2015
- Advertise Construction Contract – June 2015
- Award Construction Contract – July 2015
- Begin Construction – July 2015

- End Construction – May 2016
- Project Close Out – September 2016

It is anticipated that pre-construction services will begin immediately upon execution of the consulting services agreement and issuance of a Notice to Proceed, but that full-time construction management services will not be required until the commencement of construction and will then continue until substantial completion of the project. Part-time and intermittent services will be required until acceptance of the project.

2. SCOPE OF SERVICES

The City requires the services of a competent and experienced consulting engineering firm (CM) to provide all administration and construction management services for the construction of the Blairs Lane Bridge Replacement project. The scope of services includes, but is not limited to, preconstruction services (including review of Construction Bid Documents), administration of the construction contract, quality control, materials testing, inspection, construction surveying, utility relocation coordination, and coordination of environmental monitoring. The successful firm shall provide a field site representative who is a professional civil engineer licensed by the State of California, and who will be subject to approval by the City, to perform and function as the Resident Engineer (RE). Significant preference will be given to firms who propose an RE with at least ten years of RE experience on projects of similar size and type, which have been completed using Caltrans procedures.

In addition to the RE, the CM shall provide qualified support staff, including subconsultants, to assist the City in managing the Project, performing construction staking, coordinating environmental monitoring services, providing inspection and testing services, and monitoring the work performance of the Construction Contractor. The CM team shall be available as necessary to support the work upon receipt of the Notice to Proceed for this contract.

Individual inspectors shall have inspection experience that includes, but is not limited to, the following areas:

- General site preparation including clearing, grubbing, and grading.
- Environmentally sensitive issues such as wetland preservation/mitigation, tree protection, tree removal and mitigation, water quality management, and erosion control construction and monitoring.
- Underground construction that includes wet and dry utilities.
- Bridge construction.
- Demolition.
- New road construction, existing road widening and improvements including subgrade, structural section and paving.
- Retaining walls.

The CM Project Manager (PM) and RE shall report directly to the City Engineer. The PM and the RE can be the same person.

See **Attachment B** for details specific to the planned Scope of Services for the CM firm. Proposers

must provide an outline of the Scope of Services in accordance with Attachment B that include modifications or methodology suggestions that the Proposer recommends for this project based on its experience and include a description of why the changes are recommended.

The City will designate an office space cubical for the CM firm located within City Hall for use during construction. The CM firm shall provide its own equipment (computers, materials, testing equipment, etc).

3. SUBMITTAL OF PROPOSALS

Firms responding to this RFP shall submit four (4) copies of the proposal.

Proposals shall be submitted in sealed envelopes that bear the name and business address of the firm and shall also be plainly labeled as follows:

CITY OF PLACERVILLE
BLAIRS LANE BRIDGE REPLACEMENT PROJECT (CIP 40604)
CONSTRUCTION MANAGEMENT SERVICES PROPOSAL

The City of Placerville will accept written Proposals at the following address:

City of Placerville
Engineering Division
3101 Center Street, 3nd Floor
Placerville, CA 95667

Attn: Rebecca Neves, P.E.
City Engineer

Proposals may be hand delivered or mailed via U.S. Postal Service or overnight service. The City of Placerville will NOT accept proposals submitted via e-mail.

Deadline for receipt of Proposals is 4:00 p.m. on Thursday, May 14th, 2015.

If all required information is not provided, a Proposal may be considered incomplete and non-responsive and rejected without evaluation. Late submittals, submittals to the wrong location, or submittals with inadequate copies will be considered non-responsive. Submittal of additional information after the deadline will not be allowed.

The City of Placerville reserves the right to reject any or all Proposals and to waive any and all irregularities and to choose the firm which, in its opinion, best serves its interests. The City makes no representation that any contract will be awarded in response to this RFP. The City will not be liable for any costs incurred by the Proposers incidental to the preparation and presentation of qualifications either orally or in the Proposal. Any costs incurred in the preparation of the Proposal, in the submittal of additional information, and/or in any other aspect of the Proposal prior to the award of a written agreement will be borne by the Proposer. Proposals shall remain in effect for a period of 120 days from the submittal deadline.

4. PROPOSAL FORMAT REQUIREMENTS

Each response to this RFP shall include the information described in this section in the specified order. Failure to include all of the elements specified may be cause for rejection. Additional information may be provided, but should be succinct and relevant to the goals of this RFP. Excessive information will not be considered favorably.

The Consultant's Proposal package shall be limited to 10 pages. Charts, exhibits, and schedules may be included in 11-inch by 17-inch page format and shall be folded to fit into an 8.5-inch by 11-inch sheet and will count as one (1) page. The page limit does not include the outside cover, section dividers, cover letters, sub-consultant commitment memoranda, Scope of Services, contract comments or 100% plans and specifications review. Proposals that do not contain the required information as described in this RFP or do not contain the required number of copies may be rejected.

Responsive Proposals must include:

A. Cover Letter with the following information:

- Title of this RFP.
- Name and mailing address of firm (include physical location if mailing address is a PO Box).
- Contact person, telephone number, fax number, and email address.
- A statement that the submitting firm will perform the services and adhere to the requirements described in this RFP, including any addenda (reference the addenda by date and/or number).
- Acknowledgement that all proposals may be considered public information. Subsequent to award of a contract, or rejection of all proposals, all or part of any submittal may be released to any person or firm who may request it. Therefore, proposers shall specify in their cover letter if any portion of their submittal should be treated as proprietary and not releasable as public information. Proposers should be aware that all such requests may be subject to legal review and challenge.
- The cover letter must be signed by an officer empowered by the Consultant to sign such material and thereby commit the Consultant to the obligations contained in the RFP response. Further, the signing and submission of a response shall indicate the intention of the proposer to adhere to the provisions described in this RFP and a commitment to enter a binding contract.

B. Capabilities of Firm / Team

Provide a brief narrative of the Proposer's approach to the project. Include information related to the firm's organization, including its constituent parts, and size variation of staffing levels over the past five years.

Provide relevant summaries of the firm's experience with similar projects. The summaries should include the dates and duration of the project, one reference and a brief description of the project. The description is to include, at a minimum, an outline of the complexities of the project and the

firm's approach to the completing the project. Related experience to local agency projects of similar size and magnitude using Caltrans standards should be included in this summary, including consultant staff who worked on the project. Preference is given to project references that demonstrate an understanding by staff proposed for this project of the type of work relevant in this RFP.

C. Qualifications and Availability of Proposed Staff

Identify specific staff members to be assigned to the project and a table showing the percentage of time key staff members are available during the course of the project (June 2015 – September 2016).

Provide a brief summary of the qualifications and experience of each team member assigned, including résumé and length of service with the firm and, and the qualifications/experience of any sub consultant staff on the project team. Include an organization chart. Resumes should not more be than one (1) page. Describe current and anticipated workload of each team member; include a discussion of project commitments made to other agencies and a table showing the percentage of time key staff members are available during the course of the other projects.

Identify and include qualifications and experience of any sub-consultant(s) to be used. Identify the services which would be completed by the firm's staff and those provided by sub-consultant(s).

D. Project Understanding & Approach

Provide a detailed discussion of the firm's approach to the successful implementation of the project. Include thorough discussions of methodologies you believe are essential to accomplishing this project, including engineering constraints, milestones, and required approvals relating to the projects. Include a proposed work schedule to accomplish all of the required tasks within the desired timeline; the schedule should include submittal review/approval times for the City and other project stakeholders. Identify the staff who would be assigned to each task, including sub consultants.

Provide an outline, from the details in Attachment B - Scope of Services, of the firm's plan to accomplish the project and include any special services the firm offers to meet the City's need for timely completion and overall success.

Illustrate how the firm will manage the construction of the project effectively from the initial plan, specification and estimate review to the final punch list and close-out.

Provide a quality assurance review of the 100% Plans and Special Provisions (see Attachments E and F), and provide written comments in the form of a summary memorandum and "redline" markups of the plans and specifications. This review must be completed and submitted with the proposal.

E. Contract Exceptions/Deviations

Provide a written discussion of any objections or concerns relative to the Terms and Conditions of the attached City Consulting Services Agreement (CSA). Refer to Section 7 of this RFP and

Attachments C and D. Please note that the City intends to make no substantive changes to the CSA Terms and Conditions.

If the Consultant has ever been terminated from a contract, describe the facts and circumstances in detail on a separate sheet.

5. EVALUATION CRITERIA

The primary objective of the City is to select a qualified Consultant CM to perform necessary professional services to successfully manage the construction of the Blair Lane Bridge Replacement Project at a fair and reasonable cost. The City has established the following criteria for the selection process:

- The selection process shall be fair, open, and competitive.
- Selection shall be based upon demonstrated competence, professional qualifications, experience, and capability to perform the required services at a fair and reasonable price. Ranking of the Proposals shall follow the scoring criteria described below.
- After the Proposals are reviewed, a short list will be prepared by the selection panel.
- The short-listed firms will be interviewed. At the completion of the interviews, the firms will be rated and ranked. Negotiations will commence with the top-ranked firm. If negotiations are unsuccessful, the City will begin negotiations with the second-ranked firm. The City reserves the right to reject any and all Proposals and to negotiate with any responsible, responsive firm. The City is under no obligation to issue contracts for the services described in this RFP.

The following evaluation criteria and rating schedule will be used to determine the most highly qualified firm(s).

Evaluation Criteria	Maximum Points
1. Overall Approach to Project	5
2. Capabilities of Firm / Team	20
3. Qualifications and Availability of Proposed Staff	35
4. Project Understanding and Approach	35
5. Ability to Meet Contract Requirements	5
Total Possible Points:	**100**

Reference checks will be performed at the sole discretion of the selection committee for the top Proposers selected for interviews.

6. SELECTION SCHEDULE

Deadline for Inquires ..... May 6, 2015
Proposals Due ..... May 14, 2015, 4:00 pm
Proposal Evaluation by Review Team ..... May 19, 2015

Interviews ..... May 21, 2015
Approval of CM Agreement ..... June 9, 2015

7. SAMPLE CONTRACT / LEGAL NOTICES AND CONTRACT PROVISIONS

Attachment C provides the City's typical Consulting Services Agreement (CSA). Proposers must review the CSA and be prepared to accept as is or provide requested exceptions and/or deviations. Please note that the City intends to make no substantive changes to the CSA Terms and Conditions.

Attachment D contains the City's standard legal notices and contract provisions.

8. INQUIRIES

All inquiries and responses to the Request for Proposals (RFP) should be submitted to:

City of Placerville
Engineering Division
3101 Center Street
Placerville, CA 95667

Attention: Rebecca Neves, P.E.
City Engineer
Phone Number: (530) 642-5250

The 100% plans and specifications are attached located in Attachments E and F respectively.

9. FEE

In a separate sealed envelope, Proposer must provide a total cost proposal for all services to be delivered, and a breakdown of costs delineated by tasks as described in its Scope of Services outline. A schedule of hourly rates in a cost-plus format for all proposed staff and the amount of time each person will be devoted to this project must be included. Define any reimbursable expenses requested to be paid by the City. The cost proposal must be in a cost-plus-fixed fee format in accordance with Chapter 10 of the Caltrans Local Assistance Procedures Manual; Proposer must indicate whether or not its firm's overhead rate has been audited by Caltrans Division of Audits and Investigations or other equivalent method.

A schedule of work forming the basis of the fee proposal must be included.

10. LIST OF ATTACHMENTS

A. Location Map
B. Scope of Services
C. Sample City Consulting Services Agreement
D. Legal Notices and Contract Provisions
E. 100% Plans – Not for Construction
F. 100% Special Provisions – Not for Construction

ATTACHMENT A

LOCATION MAP

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
03	ED	BLAIRS LN			

INDEX OF PLANS

SHEET No.	DESCRIPTION
1	TITLE SHEET
2-3	TYPICAL CROSS SECTIONS
4	LAYOUT
5	PROFILE
6-11	CONSTRUCTION DETAILS
12	CONTOUR GRADING
13	EROSION CONTROL QUANTITIES
14	DRAINAGE PLAN
15-18	DRAINAGE PROFILE
19-20	DRAINAGE DETAILS
21-22	DRAINAGE QUANTITIES
23	UTILITY PLAN
24-25	SEWER AND WATER PLAN AND PROFILE
26	PRESSURE REDUCING VALVE
27	SEWER AND WATER NOTES AND DETAILS
28	CONSTRUCTION AREA SIGNS
29-32	TRAFFIC HANDLING
33	TRAFFIC HANDLING QUANTITIES
34	PAVEMENT DELINEATION AND SIGN PLAN
35-36	PAVEMENT DELINEATION AND SIGN QUANTITIES
37	TREE PLANTING PLAN
38-40	SUMMARY OF QUANTITIES

STRUCTURE PLANS

41-58	HANGTOWN CREEK BRIDGE No. 25C-0012 & RETAINING WALL PLANS

THE STANDARD PLANS LIST APPLICABLE TO THIS CONTRACT IS INCLUDED IN THE NOTICE TO BIDDERS AND SPECIAL PROVISIONS BOOK.

CITY OF PLACERVILLE

ENGINEERING DIVISION

PROJECT PLANS FOR CONSTRUCTION ON

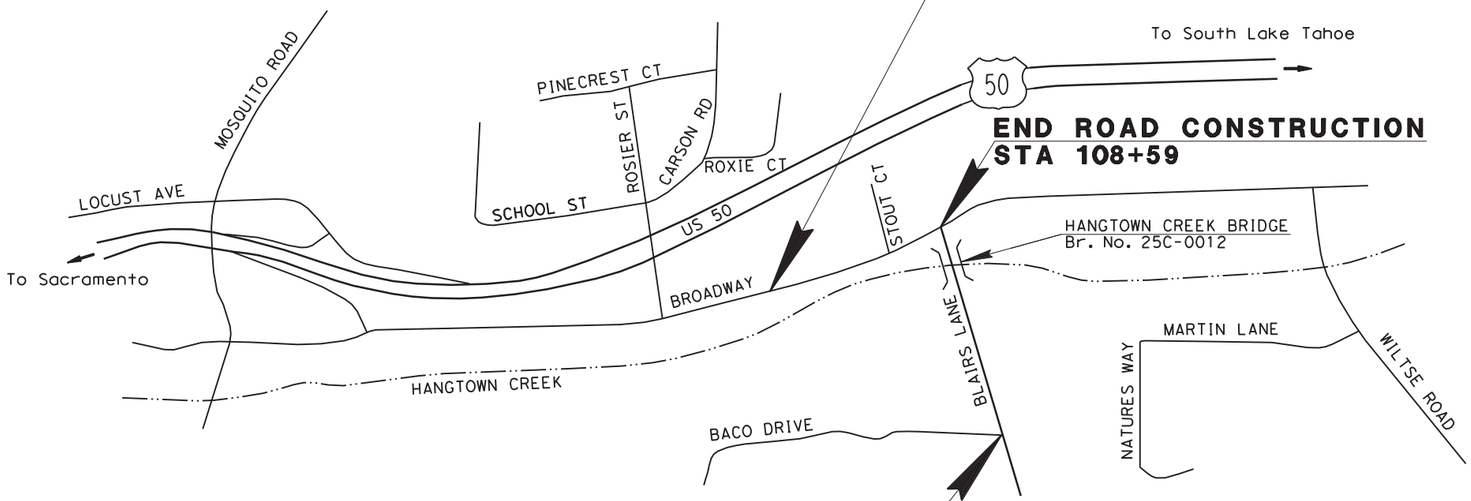
BLAIRS LANE BRIDGE REPLACEMENT IN CITY OF PLACERVILLE

PROJECT No. 40604
FEDERAL-AID BRIDGE REPLACEMENT
FEDERAL PROJECT No. BRLO 5015 (009)

To be supplemented by State of California Standard Plans dated May 2010

LOCATION MAP

100% SUBMITTAL



PROJECT PLANS FOR CONSTRUCTION ON BLAIRS LANE FOR HANGTOWN CREEK BRIDGE REPLACEMENT

This set of plans, having been reviewed by me, reflect all approved revisions to the project known to me, and all field deviations to the planned improvements by the construction contractor, as reported to me as of . It does not represent field verification of planned improvements by me.

CITY OF PLACERVILLE

City Engineer
Rebecca Neves

Plans Approval Date

REGISTERED PROFESSIONAL ENGINEER — Rebecca Neves — No. C71920 — Exp. — CIVIL — STATE OF CALIFORNIA

Project Engineer Date
Registered Civil Engineer

REGISTERED PROFESSIONAL ENGINEER — C. Davis — No. C58440 — Exp. 12/31/16 — CIVIL — STATE OF CALIFORNIA

Plans Approval Date

The Contractor shall possess the Class (or classes) of license as specified in the ''Notice to Contractors''.

ATTACHMENT A - LOCATION MAP

PROJECT ENGINEER	DATE	PROJECT MANAGER	DATE
C. DAVIS		S. MELLON	

QUINCY ENGINEERING, INC
11017 Cobblerock Drive
Rancho Cordova, CA 95670

Contract No 40604

LAST REVISION 00-00-00
DATE PLOTTED => 3/1/2015
TIME PLOTTED => 5:15:37 PM

FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

FILE => PI96RTL.DGN

CU 00000

EA 000000

ATTACHMENT B

SCOPE OF SERVICES

ATTACHMENT B

SCOPE OF SERVICES

BLAIRS LANE BRIDGE REPLACEMENT PROJECT (CIP 40604)

PROJECT BACKGROUND

The Blairs Lane Bridge Replacement Project (Construction Project) consists of replacing a single span, one lane bridge crossing Hangtown Creek on Blairs Lane. The bridge serves the community of Eskaton providing two-way through traffic to access Broadway in the City of Placerville. The City of Placerville is the Lead Agency on the project under a Cooperative Agreement with Caltrans.

Major elements of the project include the following:

- Construction of a new 2-lane single span prestressed bridge on spread footings over Hangtown Creek
- Demolition of the existing 1-lane bridge over Hangtown Creek
- Relocation of existing sewer facilities from Hangtown Creek to Broadway
- Construction of a new pressure reducing station (PRV) and connections to existing water mains
- Construction of new curbs, gutters and sidewalks on the West side of Blairs lane from Broadway to Baco Drive
- Construction of new curbs, gutters and sidewalks on the East side of Blairs lane from Broadway to the south side of the new bridge with new curb and gutter continuing south to Baco Drive
- Construction of one (1) Type 5 (Mod) Retaining Wall
- Construction of one (1) Type 5 Retaining Wall
- Construction of two (2) Modular Block Retaining Walls
- Roadway paving
- Staged Bridge Construction

PROJECT DESCRIPTION

The CITY is contracting with CONSULTANT to provide professional construction management, inspection, surveying, environmental monitoring coordination, materials testing and administrative services during construction. Work shall be performed in accordance with applicable CITY and Caltrans standards and standard practice.

ITEMS OF WORK

The CITY contracts with the CONSULTANT to provide all required construction engineering and surveying services necessary to provide project inspection, environmental monitoring coordination, materials testing, construction staking, and construction management services for the Construction Project. The intent of the contract is to have the CONSULTANT provide a Resident Engineer, necessary support staff, equipment and materials for the required services. The work product shall meet the minimum requirements identified in this Attachment B.

General

The intent of this scope of work is to set forth the requirements and responsibilities of the CONSULTANT for construction management, inspection, construction staking, material testing, verification, and recommendation for acceptance of improvements of the proposed construction project to assure consistent and satisfactory quality of such improvements in accordance with the approved construction documents.

The CONSULTANT will provide a Construction Manager (CM) and sufficient staff to perform construction administration oversight and inspection services during the construction of the Construction Project. All CONSULTANT staff shall work under the supervision of the CM. These services will encompass serving as the CITY'S Resident Engineer (RE) to the Construction Contractor and the public with regard to activities at the construction site, interpretation of the requirements of the Construction Contract Documents, assessing the acceptability of the Contractor's work, construction staking, and materials testing. The CONSULTANT's CM shall be a licensed Professional Civil Engineer registered in the State of California.

The CONSULTANT's services will include review and analysis of construction documentation prior to bidding, documentation of pre-construction site conditions, interpretation of and Contractor's conformance to the project plans, specifications, contract documents and regulatory permits. The CONSULTANT will assess the acceptability of the Contractor's work by visual observation, photo and video documentation and all applicable soil and material testing. When necessary, the CONSULTANT shall issue Notices of Non-Compliance and/or take other action to ensure correction of deficiencies. If safety violations are observed, the CONSULTANT shall take appropriate action to ensure correction. The CONSULTANT shall also manage requests for clarification, coordinate work with the design engineer, as required, and manage the project changes, evaluate Contractor's claims, and prepare progress pay estimates.

All construction management, materials testing, inspection and related activities shall be completed as described in the Construction Management Plan (CMP) Manual prepared by the CONSULTANT specifically for this project and approved by the CITY. In addition to the approved CMP Manual, the CONSULTANT shall perform its activities in accordance with, but not limited to, the following documents:

a) Project Plans and Specifications
b) Regulatory Agency Permits
c) Public Works Inspectors Manual, 7th Edition
d) Caltrans Local Assistance Procedures Manual
e) Caltrans Construction Manual & Bulletins
f) Caltrans Standard Test Methods
g) Caltrans Surveys Manual
h) Caltrans Manual of Traffic Control for Construction & Maintenance Work Zones
i) Manual of Uniform Traffic Control Devices & California Supplement

Time required by the CONSULTANT to reach the designated construction office will not be considered part of the services for which payment will be made.

Time charged by each individual to a contract executed as a result of this Proposal shall be documented on CONSULTANT provided time sheets. A copy of each time sheet shall be turned in to the CITY no less than every two weeks. Billing shall be on a four-week interval as designated by the CITY.

There shall be no reimbursable expenses on this project unless approved in writing, in advance, by the CITY.

Project inspection, materials testing, construction staking, construction management, and related construction engineering services shall include the following tasks:

Task 1 Construction Management Plan

The CONSULTANT shall prepare a Construction Management Plan for the project for CITY approval. The plan shall indicate the standards and level of effort that the CONSULTANT's staff will adhere to during all phases of this work and describe deliverables to be received by the CITY. At a minimum, the plan shall include the sections listed below:

a) Project Organization
b) Meetings
c) Communications Management
d) Preparation of Management Reports
e) Clarifications and Contract Interpretations of Specifications
f) Submittals/Shop Drawings

g) Design Modifications
h) Change Orders
i) Schedule Management
j) Claims Management and Resolution
k) Testing and Testing Documentation
l) Progress Pay Estimate Preparation
m) Inspection and Inspection Reporting
n) Construction staking
o) Defective Work Correction
p) Record Drawings
q) Complaint & Community Relations Procedures
r) Safety
s) Photo/Video Documentation
t) Certified Payroll Review
u) Special Inspections
v) Other Tasks

The plan shall describe the level of effort anticipated to be maintained by the Construction Manager (CM) and inspectors for the various activities during the construction period and project closeout. The plan shall describe all deliverables and timing for periodic reports.

Deliverables:

- *Three copies of final Construction Management Plan due prior to the pre-construction conference.*

Task 2 Administration

The Consultant is to provide construction administration of the project to facilitate the ongoing construction efforts and maintain State and CITY regulations. At a minimum the consultant shall:

a) Comply with Cal-OSHA regulations regarding safety equipment and procedures, and safety instructions issued by the State.

b) Provide administrative, management and related services as required to coordinate the work of the contractor, to complete the project in accordance to contract documents, State regulations and in with the CITY's objectives for cost, time and quality. Provide weekly status reports and working days statements to CITY. Weekly status reports shall include summaries of work that is currently being performed, behind schedule, unresolved deficiencies and defective work, outstanding change orders and status of any claims.

c) Coordinate with the CITY and all other involved agencies to obtain and comply with all required permits.

d) Recommend necessary or desirable changes in the construction contractor's scope of work to the CITY, review and evaluate contractor's request for changes, assist in negotiating contractor's proposals, submit recommendations to the CITY supported by field data, and if they are accepted, prepare change orders for signature and the CITY's authorization.

e) Maintain strict cost accounting records on authorized work performed under unit costs, additional work performed on the basis of actual costs of labor and materials, or other work requiring accounting records.

f) Develop and implement procedures for the review and processing of applications by contractor for progress and final payments. Make written recommendations to the CITY for Contractor payments.

g) Consult with the design engineer and the CITY if the contractor requests interpretations of the meaning and intent of the drawings and specifications, and assist in the resolution of questions, which may arise.

h) Provide a staffing schedule each month for the following month. This schedule is subject to the CITY's approval.

i) Manage any utility work to be performed by utility agencies (work not part of contractor's responsibilities); specifically PG&E, AT&T and Comcast.

Deliverables:

- *Weekly Status Reports and statements of working days*
- *Required permits*
- *Cost Control Program*
- *Cost Accounting Records*
- *Progress Payment Recommendations*
- *Draft and Final Change Orders*
- *Staffing Schedules*
- *Other reports as required*

Task 3 Pre-Bid Contract Document Review

CONSULTANT shall perform a quality assurance review the 100% PS&E package and provide written comments in the form of a summary memorandum and "redline" markups of the plans and specifications. This review must be completed and submitted with the proposal.

CONSULTANT shall review final contract plans, specifications, permits, agreements, easements, environmental documents and the Resident Engineer files consisting of design engineer memos to Resident Engineer, and technical reports and studies.

CONSULTANT shall prepare a project schedule which includes all preconstruction and construction utility relocations, and notification timelines noted on all permits, agreements, and contract documents. Upon receipt of contractor's schedule, the RE's schedule will be updated.

Deliverables:

- *Quality Assurance review memorandum and markups*
- *Schedule*

Task 4 Documentation of Pre-Construction Conditions

CONSULTANT shall document pre-construction site conditions using photographs, written notes and video. Special or sensitive areas shall be noted and extra documentation may be required for these special or sensitive areas. Each photo shall be labeled with date, location, detailed description and photographer's name. Copies of all documentation, including photographs, notes, and video, shall be submitted to the CITY's Engineer and become the property of the CITY.

Deliverables:

- *Copies of all documentation, including photographs, notes, and video*

Task 5 Documentation and Record Keeping

The Consultant shall maintain all documents to provide a detailed account of the construction effort, progress and contractual obligations. The consultant shall provide at a minimum the services below:

a) Verify that all required certificate of bonds and insurance have been received from the contractor and forwarded to the CITY for approval.

b) Maintain at the project field office, on a current basis and in good order: a record copy of all contracts, drawings, specifications, addenda, change orders and other modifications; shop drawings, product data, samples, submittals, purchases, materials, equipment, applicable handbooks, maintenance and operating manuals and instructions; and other related documents and revisions which are relevant to the contract work.

c) During the course of construction, maintain one set of plans with markings and dimensions in red ink to denote field changes or other corrections.

d) A detailed photographic history of all phases of the project will be maintained on a daily basis. Each photograph will be labeled as to location, direction of view, date, time and items of interest. The photographs will be maintained in an album and the photographs will be indexed for ease of retrieval. Photos will also be taken of the following:

- Traffic Control
- Disputed work items
- Work that has to be duplicated, replaced or removed
- Completed work
- Extra work

Deliverables:

- *Documents required by this section*

Task 6 Meetings

Anticipated meetings include: a project review meeting with the CITY and Design Engineer, a pre-construction meeting with the Contractor, CITY, design engineer, regulatory agencies, and utility companies. Periodic meetings shall include daily discussions between the CM or designated representative and the Contractor; weekly meetings between the CM and CITY; and meetings scheduled as needed with regulatory agencies, other groups, or agencies. Consultant shall take minutes of the meetings and distribute them to attendees within one week of the meeting. Meetings shall be held at the offices of the CITY Engineering Division or at a mutually agreeable location determined during the pre-construction meeting.

Deliverables:

- *Project Review Meeting with CITY and Design Engineer*
- *Pre-construction meeting with CITY and all applicable parties related to the project.*
- *Weekly meetings with CITY and all applicable parties related to the project.*
- *Any meetings necessary to immediately resolve project issues related to scope, cost, or schedule.*
- *Meeting minutes*

Task 7 QSD/QSP Water Quality Monitoring and SWPPP Support

CONSULTANT shall have a Qualified Storm Water Pollution Prevention Plan Developer (QSD) which shall make any necessary changes to the Storm Water Pollution Prevention Plan (SWPPP) during both design and construction. The QSD shall also prepare a site specific Construction Site Monitoring Plan (CSMP). The CSMP shall include all monitoring procedures and instructions, monitoring locations, weather and rain event tracking requirements, visual monitoring frequencies, visual monitoring triggers, visual monitoring documentation requirements, effluent monitoring frequencies. effluent monitoring triggers for routine and non-visible pollutants, sampling taking and handling procedures, identify Quality Assurance (QA) & Quality Control (QC), follow up procedures for violations and action thresholds, location maps, forms, and checklists as required by the Construction General Permit (2009-0009-DWQ as amended by 2010-0014-DWQ). The QSD shall also prepare a post-construction storm water operation and management plan. A Notice of Intent (NOI) has been filed into the State Water Resources Control Board S.M.A.R.T.S System. The consultant shall perform all necessary work to determine the Risk Level of the project. (Most likely this will be a Risk Level 2 project).

The Consultant shall also provide a Qualified SWPPP Practitioner (QSP) for the duration of the construction of the project and will be responsible to comply with all requirements of the current Construction General Permit (2009-0009-DWQ as amended by 2010-0014-DWQ). This shall include but not be limited to the following for the entire length of the construction of the project:

a) Documented weekly Run-off and Run-on BMP inspections.

b) Documented Runoff and Run-on monitoring.

c) Preparation of all Quarterly Reports as required by the Construction General Permit (2009-0009-DWQ as amended by 2010-0014-DWQ).

d) Preparation of all Annual Reports as required by the Construction General Permit (2009-0009-DWQ as amended by 2010-0014-DWQ).

e) Preparation of a Rain Event Action Plan (REAP) every time NOAA predicts a 50% chance or more of rain 48 hours in advance of a storm event in the project area.

f) Documented pre-storm, storm, and post storm visual inspections/monitoring along with site photographs before, during, and after each Qualifying Rain Event when NOAA predicts a probability of rain of 50% or more in the project area.

g) Documented quarterly non-storm water discharge inspections/monitoring.

h) All required sampling and analysis of construction site runoff, non-storm water discharges, receiving waters, and contained runoff as required by the Construction General Permit (2009-0009-DWQ as amended by 2010-0014-DWQ). This includes but is not limited to Turbidity, Suspended Solids Concentration (SSC), pH, and for other pollutants as mandated by the Regional Water Quality Control Board.

i) Preparation of all Numeric Action Level (NAL) and Numeric Effluent Limitation (NEL) Exceedance Reports.

j) Ensure the proper implementation of the post-construction storm water operation and management plan at the end of construction.

k) Complete extensive photo documentation at the end of construction necessary for the successful filing of the Notice of Termination (NOT).

The Consultant's QSD and QSP shall be involved in the duration of the construction of the project and will ensure the project is completed to the satisfaction of the State Water Resources Control Board and the appropriate Notice of Termination (NOT) is filed and approved by the State Water Resources Control Board. The consultant shall demonstrate final stabilization of the project area at the end of construction, which is necessary for approval of the NOT, by showing either 70% vegetation coverage, use of the RUSLE 2 method as computational proof, or the custom method through sampling that turbidity is 100NTU or less. The consultant shall assist the CITY in the filing of the NOT.

Deliverables:

- *Weekly, Quarterly & Annual Inspection and Monitoring Reports*
- *Preparation of REAP*
- *NAL and NEL Reports*
- *NOT*

Task 8 Schedule Review

The CONSULTANT shall review the Contractor's construction schedule, request updates on a weekly basis and track delays or accelerations based on actual Contractor operations as defined in the CMP. Work with the Contractor to maintain the project schedule to show current conditions and suggest revisions that may be required.

Deliverable:

- *Weekly Schedule Review Documentation*

Task 9 Cost Control and Monthly Progress Payments

The CM shall implement necessary procedures for an effective system of cost control to track progress payments, contract change orders, claims and extra work requests. The Construction Manager shall prepare quantities and estimates for monthly progress payments on the 19th of the month, and recommend approval to the CITY. CONSULTANT shall maintain cost accounting records (progress

payments, CCO status, etc.) in accordance with CITY procedures. The calculations of quantities and documentation shall be in a form approved by the CITY.

Deliverable:

- *Cost Control Tracking Documentation*

Task 10 Contract Modifications and Extra Work, Contract Change Orders, Claims

The CM shall perform the evaluation and administration of all contract modifications, requests for information, change orders, and claims. The CM shall review all requests for merit, perform an independent estimate, and make recommendations to the CITY for consideration. All contract modifications, extra work, and contract change orders shall be approved by the CITY. If approved, the CM will complete all required documentation to process the change. If the CM receives a notice of claim from the Contractor, the CM shall immediately notify the CITY and work toward a timely resolution of the claim with the Contractor. Status of any outstanding claims will be included with the CONSULTANT's weekly report to the CITY. The CONSULTANT shall support the CITY in any post-completion dispute with the Contractor, rendering reasonable assistance, providing access to its records, but is not intended to retain independent experts.

Deliverables:

- *Contract Modification & Extra Work Documentation*
- *Draft CCO's with Recommendation Memorandum*
- *Final CCO's*

Task 11 Submittals and Clarifications

The CM shall issue necessary clarifications and interpretations of the Contract Project Documents in response to Requests for Information (RFI) by the Contractor in a manner as described in the CMP. The CM shall also accept and process submittals, including but not limited to shop drawings, product data and product samples. The CM shall draft a list of required submittals in accordance with the project Specification for the CITY to review. The list shall be submitted to the CITY no later than 15 days after award of the Contract. The CM shall review those submittals that are appropriate. Submittals requiring review by the CITY shall be logged and transmitted for formal review. Updated submittal logs shall be made available to the CITY upon request. The CM shall be responsible for tracking submittals to assure the submittals are reviewed and returned to the Contractor in a timely manner.

Deliverables:

- *Submittal and RFI logs*
- *Documentation for clarification and interpretation of the Project Plans and Specifications*

Task 12 Field Inspection and Quality Assurance

The CONSULTANT shall review the work of the Contractor, trade and specialty contractors on the project as it is being performed, until final completion and acceptance by the CITY, to assure that the work performed and materials furnished are in accordance with the Contract Documents.

The CONSULTANT shall provide sufficient inspectors (who are acceptable to the CITY) to adequately inspect all Contractor's construction work. The CM or inspectors shall provide field inspection of Contractor's construction work on a daily basis. The CM or inspectors will review all construction prior to backfill, and provide for observation of all tests required to be performed by the Contractor or referenced in the Contract Documents. The CM and field inspectors shall monitor the Contractor's performance from the perspective of quality, cost, and schedule, and shall enforce the requirements of applicable Specifications. Daily Inspection Reports and diaries of Contractor's construction activities shall be completed daily by each inspector and be available to the CITY at any time. The CM or designated representative shall compare notes with the Contractor's representative at the end of each day to confirm work that was accomplished or quantities placed.

The CM shall prepare and submit written weekly reports to the CITY describing updates of project process, percent of work completed, percent of funds expended, listing of change orders, and community

relations issues. All outstanding deficiencies and claims shall also be noted in the weekly reports until resolved or settled. The CM shall document any defective work until it is repaired to the CM's satisfaction and in accordance with the Contract Documents' applicable specification. Copies of the daily reports from the previous week will be included with the weekly written report.

The CM or inspectors will document, in writing and by photograph or video, special situations or defective work until it is repaired to the CM and CITY's satisfaction and quality of work in accordance with the Contract Documents.

Daily inspection reports shall include, at a minimum, the following information: Contractor's activities, weather conditions, discussions with the Contractor, problems and issues dealt with, approved changes, and any other information necessary to create a satisfactory record of the day's activities at the project site in accordance with standard inspection practice.

The CM shall maintain a "hotline" phone number and answering service and/or official website for the public for the purpose of tracking complaints.

Deliverables:

- *Daily Inspection Reports*
- *Weekly Reports*
- *Monthly Complaint Log*

Task 13 Testing

The CONSULTANT shall provide, coordinate, and monitor all field and laboratory testing of soils, backfill, structural backfill, aggregate base, asphalt, concrete, and other testing required by law, or the Construction Specifications. Caltrans-certified technicians shall complete all testing work and all laboratory facilities shall be Caltrans certified to perform the respective tests and be approved by the CITY. The CM will review results of tests, forward copies to the CITY as a part of the weekly reports and work with the Contractor to resolve deficiencies or defective work. All test procedures will be in accordance with the Contract Documents and applicable Specifications.

Deliverables:

- *Copies of all testing results*

Task 14 Construction Surveying

CONSULTANT shall provide all necessary construction control staking for the project in accordance with Chapter 12 of the Caltrans Surveys Manual. All Construction staking shall be done under the direction of a Professional Land Surveyor.

In addition, the CONSULTANT shall implement a survey Quality Assurance Program as described in the approved CMP. At a minimum the program will provide for a qualified licensed surveyor to assist the CM in verifying the following:

a) Check bridge foundation and abutment layouts
b) Check retaining wall layouts and forms
c) Check Station Line
d) Check drainage layout
e) Check subgrade
f) Check AB Grade
g) Check final road grades
h) As-built survey

Task 15 Final Completion and Acceptance

After the project is substantially complete, the CM will schedule a walk through with the CITY and shall coordinate preparation of a "punch list" of incomplete or unsatisfactory items and submit the list to the Contractor. Once all work is complete, the CONSULTANT will deliver a statement to the CITY indicating that to the best of the CONSULTANT'S knowledge and belief, after diligent investigation including

satisfaction of its other obligations under the agreement, that the project has been completed in accordance with the Project Construction Contract Documents and CONSULTANT recommends acceptance. A Proposed Final Estimate signed by the CM and the Contractor shall accompany the recommendation for acceptance.

Deliverables:

- *Notice of Substantial Completion*
- *Punch Lists*
- *Proposed Final pay Estimate*

Task 16 Other Tasks

As part of the inspection and construction administration activities, the CONSULTANT shall include the tasks listed below as part of the overall project activities:

a) Inspect traffic control and erosion control measures as often as necessary to assure activities meet with the approved plans and submittals.

b) Provide community relations outreach effort by providing information on areas to be under construction to CITY for publication in newspapers and radio and tracking and resolving community complaints.

c) Inspect landscaping and other improvements within the right of way and public easements for damage.

d) Any damage identified shall be documented and tracked until the Contractor repairs the damage to pre-project conditions or to plans and specifications.

e) Review weekly certified payrolls for compliance with State and Federal wage rate requirements as required by Contract Documents. The CONSULTANT shall enforce the requirements of the California Labor Code as they pertain to the Project. The detailed description of the Labor Code requirements is described in Section 7 of the State Standard Specifications. The CONSULTANT shall also review the certified payrolls submitted by the Contractor for full conformance with Section 7 of the State Standard Specifications.

f) Notify the CITY of any errors or omissions that are found on the plans or specifications during construction within one working day after such errors are discovered.

g) Perform routine evaluations of project-related off-road and heavy duty on-road equipment emissions for compliance by personnel ARB certified to perform Visible Emission Evaluations.

h) CONSULTANT shall monitor Contractor's coordination with various utility companies.

i) CONSULTANT shall take appropriate action to ensure correction of observed safety violations under the requirements of the CAL OSHA Construction Safety Orders.

Deliverable:

- *Documentation of Activities per CMP*

Task 17 Project Close Out

The CONSULTANT shall verify any operating and/or Regulatory Agency permits are obtained and inspections are complied with and completed.

The CONSULTANT will submit to the CITY the following close out items:

a) All records, maps, and plans maintained by the CONSULTANT during construction.

b) All approved shop drawings, submittals and manufacturer’s literature maintained by the CONSULTANT during the construction project.

c) One complete electronic set of annotated project progress photographs, ordered chronologically, and video footage taken before and during construction.

d) The original set of all inspection reports, summaries, testing documents, meeting minutes, clarifications, schedules, correspondence and other documents related to the construction work as it was being installed.

e) A set of red line Record Drawings documenting any changes and/or substitutions that have been reviewed for accuracy and completeness by the CONSULTANT and a recommendation for the CITY to accept the Record Drawings.

Deliverables:

- *All records, maps and plans maintained during construction.*
- *All shop drawings, submittals, and manufacturer's literature maintained during construction.*
- *Annotated project progress photographs and videotapes taken of construction project.*
- *Record drawings of field changes.*
- *Original inspection reports, summaries, testing documents, meeting minutes, clarifications, schedules, correspondences and other documents of construction.*
- *Red-line record drawings.*

CONSULTANT STAFFING

The CONSULTANT proposes to use ___(name to be proposed as part of response to RFP)___ as the on-site Construction Manager/Resident Engineer for this contract. Additional staff and sub-consultants are to be brought in on an as-needed basis. The CITY maintains the right to request additional staff if, in its opinion, there is inadequate coverage during any phase of the project. In the event there is a need to substitute key personnel by the CONSULTANT for construction management or inspection responsibility, the CONSULTANT shall only substitute personnel after submitting resumes and obtaining specific written approval by the CITY for the replacement staff in these key positions.

The City Engineer shall have the authority to reject the Construction Manager, field inspection personnel, construction surveyors, or testing technicians in the event of unsatisfactory performance by said personnel in the opinion of the CITY. The CONSULTANT shall provide qualified replacement staff acceptable to the CITY.

ATTACHMENT C

SAMPLE CITY CONSULTING SERVICES AGREEMENT

ATTACHMENT C

CONSULTANT SERVICES AGREEMENT

THIS AGREEMENT made and entered by and between the City of Placerville, a political subdivision of the State of California (hereinafter referred to as "City") and _____ a company duly qualified to conduct business in the State of California, whose principal place of business is _____, (hereinafter referred to as "Consultant");

W I T N E S S E T H

WHEREAS, City has determined that it is necessary to obtain a Consultant to provide services _____

WHEREAS, Consultant has represented to City that it is specially trained, experienced, expert and competent to perform the special services required hereunder and City has determined to rely upon such representations; and

WHEREAS, it is the intent of the parties hereto that such services be in conformity with all applicable federal, state and local laws; and

NOW, THEREFORE, City and Consultant mutually agree as follows:

ARTICLE I

Scope of Services: Consultant agrees to provide to City those described in Exhibit "A", incorporated herein and made by reference a part hereof.

ARTICLE II

Term: This Agreement shall become effective when fully executed by both parties hereto and shall expire on_____. This Agreement may be extended for one additional one-year period, if mutually agreed by both parties hereto, in writing not less than thirty (30) days prior to the expiration of this Agreement.

ARTICLE III

Compensation for Services: For services provided herein, City agrees to pay Consultant in accordance with the rates and charges identified in Exhibit "B", incorporated herein and made by reference a part hereof. Payment shall be made within thirty (30) days following City receipt and approval of itemized invoice(s) detailing services rendered, less five percent (5%) retention. Retention will be paid on final bill. The total amount of this Agreement shall not exceed $_____.

ARTICLE IV

Changes to Agreement: This Agreement may be amended by mutual consent of the parties hereto. Said amendments shall become effective only when in writing and fully executed by duly authorized officers of the parties hereto.

ARTICLE V

Consultant to City: It is understood that the services provided under this Agreement shall be prepared in and with cooperation from City and its staff. It is further agreed that in all matters pertaining to this Agreement, Consultant shall act as Consultant only to City and shall not act as Consultant to any other individual or entity affected by this Agreement nor provide information in any manner to any party outside of this Agreement that would conflict with Consultant's responsibilities to City during term hereof.

ARTICLE VI

Assignment and Delegation: Consultant is engaged by City for its unique qualifications and skills as well as those of its personnel. Consultant shall not subcontract, delegate or assign services to be provided, in whole or in part, to any other person or entity without prior written consent of City.

ARTICLE VII

Independent Consultant/Liability: Consultant is, and shall be at all times, deemed independent and shall be wholly responsible for the manner in which it performs services required by terms of this Agreement.

Consultant exclusively assumes responsibility for acts of its employees, associates and sub consultants, if any are authorized herein, as they relate to services to be provided under this Agreement during the course and scope of their employment.

Consultant shall be responsible for performing the work under this Agreement in a safe, professional, skillful and workmanlike manner and shall be liable for its own negligence and negligent acts of its employees. City shall have no right of control over the manner in which work is to be done and shall, therefore, not be charged with responsibility of preventing risk to Consultant or its employees.

ARTICLE VIII

Fiscal Considerations: The parties to this Agreement recognize and acknowledge that funding for this project is from State funds currently pending final encumbrance, and should said funds not become available to the City, City reserves the right to terminate the agreement prior to the notice to proceed without liability.

ARTICLE IX

Default, Termination and Cancellation:

A. Default: Upon the occurrence of any curable default of the provisions of this Agreement, a party shall give written notice of said default to the party in default (notice). If the party in default does not

cure the default within ten (10) days of the date of notice (time to cure), then such party shall be in default. The time to cure may be extended at the discretion of the party giving notice.

Should the default be non-curable, the city shall have the right to terminate this agreement immediately.

Any extension of time to cure must be in writing, prepared by the party in default for signature by the party giving notice and must specify the reason(s) for the extension and the date on which the extension of time to cure expires.

Notice given under this section shall specify the alleged default and the applicable Agreement provision and shall demand that the party in default perform the provisions of this Agreement within the applicable period of time. No such notice shall be deemed a termination of this Agreement unless the party giving notice so elects in this notice, or the party giving notice so elects in a subsequent written notice after the time to cure has expired.

B. Bankruptcy: This Agreement, at the option of the City, shall be terminable in the case of bankruptcy, voluntary or involuntary, or insolvency of Consultant.

C. Ceasing Performance: City may terminate this Agreement in the event Consultant ceases to operate as a business, or otherwise becomes unable to substantially perform any term or condition of this Agreement.

Termination or Cancellation without Cause: City may terminate this Agreement in whole or in part seven (7) calendar days upon written notice by City for any reason. If such prior termination is effected, City will pay for satisfactory services rendered prior to the effective dates as set forth in the Notice of Termination provided to Consultant, and for such other services, which City may agree to in writing as necessary for contract resolution. In no event, however, shall City be obligated to pay more than the total amount of the contract. Upon receipt of a Notice of Termination, Consultant shall promptly discontinue all services affected, as of the effective date of termination set forth in such Notice of Termination, unless the notice directs otherwise. In the event of termination for default, City reserves the right to take over and complete the work by contract or by any other means.

ARTICLE X

Notice to Parties: All notices to be given by the parties hereto shall be in writing and served by depositing same in the United States Post Office, postage prepaid and return receipt requested. Notices to City shall be in duplicate and addressed as follows:

CITY OF PLACERVILLE

ENGINEERING DIVISION

3101 CENTER STREET

PLACERVILLE, CA 95667

ATTN: Nate Stong, City Engineer

Or; to such other location as the City directs.

Notices to Consultant shall be addressed as follows:

_____

_____

Or; to such other location as the Consultant directs.

ARTICLE XI

Indemnity:

a) Indemnification for Professional Liability. Where the law establishes a professional standard of care for Consultant's Services, to the fullest extent permitted by law, Consultant shall indemnify, protect, defend and hold harmless City and any and all of its officials, employees and agents ("Indemnified Parties") from and against any and all losses, liabilities, damages, costs and expenses, including attorney's fees and costs to the extent same are caused in whole or in part by any negligent or wrongful act, error or omission of Consultant, its officers, agents, employees or sub-consultants (or any entity or individual that Consultant shall bear the legal liability thereof) in the performance of professional services under this Agreement.

b) Indemnification for Other than Professional Liability. Other than in the performance of professional services and to the full extent permitted by law, Consultant shall indemnify, protect, defend and hold harmless City, and any and all of its employees, officials and agents from and against any liability (including liability for claims, suits, actions, arbitration proceedings, administrative proceedings, regulatory proceedings, losses, expenses or costs of any kind, whether actual, alleged or threatened, including attorneys fees and costs, court costs, interest, defense costs, and expert witness fees), where the same arise out of, are a consequence of, or are in any way attributable to, in whole or in part, the performance of this Agreement by Consultant or by any individual or entity for which Consultant is legally liable, including but not limited to officers, agents, employees or sub-contractors of Consultant.

c) Limitation of Indemnification. Notwithstanding any provision of this Section (Article XI) - Indemnification to the contrary, design professionals are required to defend and indemnify the City only to the extent permitted by Civil Code Section 2782.8, which limits the liability of a design professional to claims, suits, actions, arbitration proceedings, administrative proceedings, regulatory proceedings, losses, expenses or costs that arise out of, pertain to, or relate to the negligence, recklessness, or willful misconduct of the design professional. The term "design professional," as defined in Section 2782.8, is limited to licensed architects, licensed landscape architects, registered professional engineers, professional land surveyors, and the business entities that offer such services in accordance with the applicable provisions of the California Business and Professions Code.

d) The provisions of this section do not apply to claims occurring as a result of City's sole or active negligence. The provisions of this section shall not release City from liability arising from gross negligence or willful acts or omissions of City or any and all of its officials, employees and agents.

ARTICLE XII

Insurance: Consultant shall provide proof of a policy of insurance satisfactory to the City and documentation evidencing that Consultant maintains insurance that meets the following requirements:

A. Workers' Compensation & Employers Liability

- Workers' Compensation insurance with statutory limits as required by the Labor Code of the State of California.
- Employers Liability with limits of 1,000,000 per Accident; 1,000,000 Disease per employee; 1,000,000 Disease per policy.
- Thirty (30) days' prior written notice of cancellation or material change must be provided to CITY.
- Required Evidence of Coverage:

    1. Properly completed Certificate of Insurance.

B. General Liability

- Commercial General Liability Insurance no less broad than ISO form CG 00 01.
- Coverage must be on a standard Occurrence form. Claims-Made forms are not acceptable without prior written consent. Modified, limited or restricted Occurrence forms are not acceptable without prior written consent.
- Minimum Limits: 1,000,000 per Occurrence; 2,000,000 General Aggregate; 2,000,000 Products/Completed Operations Aggregate.
- Prior written consent is required if the insurance has a deductible or self-insured retention in excess of $25,000.
- CITY must be endorsed as an additional insured for liability arising out of ongoing and completed operations by or on behalf of the Consultant.
- The policy definition of "insured contract" must include assumptions of liability arising out of both ongoing operations and the products-completed operations hazard ("f" definition of insured contract in ISO form CG 00 01, or equivalent).
- The insurance provided to CITY as an additional insured must be primary and non-contributory with respect to any insurance or self-insurance program maintained by CITY.
- Thirty (30) days' prior written notice of cancellation or material change must be provided to CITY.
- The policy must cover inter-insured suits and include a "separation of Insureds" or "severability" clause which treats each insured separately.
- Required Evidence of Coverage:

    1. Copy of the additional insured endorsement or policy language granting additional insured status;
    2. Copy of the endorsement or policy language indicating that coverage applicable to CITY is primary and non-contributory; and
    3. Properly completed Certificate of Insurance.

C. Automobile Liability

- Minimum Limit: $1,000,000 Combined Single Limit per Accident.
- Required Evidence of Coverage:

    1. Copy of endorsement or policy language indicating that CITY is an insured; and

2. Properly completed Certificate of Insurance.

D. Professional Liability Insurance or Errors & Omissions Coverage

- Minimum Limit: $1,000,000.
- Prior written consent is required if the insurance has a deductible or self-insured retention in excess of $25,000.
- If the insurance is on a Claims-Made basis, the retroactive date shall be no later than the commencement of the work.
- Coverage applicable to the work performed under this agreement shall be continued for two (2) years after completion of the work. Such continuation coverage may be provided by one of the following: (1) renewal of the existing policy; (2) an extended reporting period endorsement; or (3) replacement insurance with a retroactive date no later than the commencement of the work under this Agreement.
- Thirty (30) days' prior written notice of cancellation or material change must be provided to CITY.
- Required Evidence of Coverage:

  1. Properly completed Certificate of Insurance.

E. Standards for Insurance Companies

- Insurance policies must be issued by an insurer with an A.M. Best's rating of at least A:VII.

F. Documentation

- The Certificate of Insurance must include the following reference: Western Placerville Interchanges Phase 1A Project (Construction Management)
- The name and address for Additional Insured endorsements, Certificates of Insurance and Notice of Cancellation is: (City of Placerville, Nathan Stong, 3101 Center St., Placerville, CA 95667)
- Current Evidence of Coverage must be provided for the entire required period of insurance.
- Upon written request, certified copies of required insurance policies must be provided within thirty (30) days.

G. Consultant agrees that the insurance required above shall be in effect at all times during the term of this Agreement. In the event said insurance coverage expires at any time or times during the term of this Agreement, Consultant agrees to provide at least thirty (30) days prior to said expiration date, a new certificate of insurance evidencing insurance coverage as provided for herein for not less than the remainder of term of the Agreement, or for a period of not less that one (1) year. New certificates of insurance are subject to the approval of City and Consultant agrees that no work or services shall be performed prior to the giving of such approval. In the event the Consultant fails to keep in effect at all times insurance coverage as herein provided, City may, in addition to any other remedies it may have, terminate this Agreement upon the occurrence of such event.

H. The certificate of insurance must include the following provisions stating that:

1. The insurer will not cancel the insured's coverage without thirty (30) days prior written notice to City, and;

2. The City of Placerville, its officers, officials, employees and volunteers are included as additional insured, but only insofar as the operations under this Agreement are concerned. This provision shall apply to all liability policies except worker's compensation and professional liability insurance policies.

I. The Consultant's insurance coverage shall be primary insurance as respects the City, its officers, officials, employees and volunteers. Any insurance or self-insurance maintained by the City, its officers, officials, employees or volunteers shall be in excess of the Consultant's insurance and shall not contribute with it.

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

K. Any failure to comply with the reporting provisions of the policies shall not affect coverage provided to the City, its officers, officials, employees or volunteers.

L. The insurance companies shall have no recourse against the City of Placerville, its officers and employees or any of them for payment of any premiums or assessments under any policy issued by any insurance company.

M. Consultant's obligations shall not be limited by the foregoing insurance requirements and shall survive expiration of this Agreement.

N. In the event Consultant cannot provide an occurrence policy, Consultant shall provide insurance covering claims made as a result of performance of this Agreement for not less than three (3) years following completion of performance of this Agreement.

O. Certificate of insurance shall meet such additional standards as may be determined by the City as essential for protection of the City.

ARTICLE XIII

Interest of Public Official: No official or employee of City who exercises any functions or responsibilities in review or approval of services to be provided by Consultant under this Agreement shall participate in or attempt to influence any decision relating to this Agreement which affects personal interest or interest of any corporation, partnership or association in which he/she is directly or indirectly interested; nor shall any such official or employee of City have any interest, direct or indirect, in this Agreement or the proceeds thereof.

ARTICLE XIV

Interest of Consultant: Consultant covenants that Consultant presently has no personal interest or financial interest, and shall not acquire same in any manner or degree in either: 1) any other contract connected with or directly affected by the services to be performed by this Agreement; or, 2) any other entities connected with or directly affected by the services to be performed by this Agreement. Consultant further covenants that in the performance of this Agreement no person having any such interest shall be employed by Consultant.

ARTICLE XV

California Residency (Form 590): All independent Consultants providing services to the City must file a State of California Form 590, certifying their California residency or, in the case of a corporation, certify that they have a permanent place of business in California. The Consultant will be required to submit a Form 590 prior to execution of an Agreement or City shall withhold seven (7%) percent of each payment made to the Consultant during term of the Agreement. This requirement applies to any agreement/contract exceeding $1,500.00.

ARTICLE XVI

Taxpayer Identification Number (Form W-9): All independent Consultants or Corporations providing services to the City must file a Department of the Treasury Internal Revenue Service Form W-9, certifying their Taxpayer Identification Number.

ARTICLE XVII

City Business License: To conduct business within the City of Placerville Consultant must be in possession of a valid City Business License.

ARTICLE XVIII

Administrator: The City Officer or employee with responsibility for administering this Agreement is Nathan Stong, City Engineer, or successor.

ARTICLE XIX

Authorized Signatures: The parties to this Agreement represent that the undersigned individuals executing this Agreement on their respective behalf are fully authorized to do so by law or other appropriate instrument and to bind upon said parties to the obligations set forth herein.

ARTICLE XX

Partial Invalidity: If any provision of this Agreement is held by a court of competent jurisdiction to be invalid, void or unenforceable, the remaining provisions will continue in full force and effect without being impaired or invalidated in any way.

ARTICLE XXI

Venue: Any dispute resolution action rising out of this Agreement, including, but not limited to, litigation, mediation or arbitration, shall be brought in El Dorado County, California, and shall be resolved in accordance with the laws of the State of California. Consultant waives any removal rights it might have under Code of Civil Procedure Section 394.

ARTICLE XXII

Entire Agreement: This document and the documents referred to herein or exhibits hereto are the entire Agreement between the parties and they incorporate or supersede all prior written or oral Agreements or understandings.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement the day and year first below written.

- - C I T Y O F PLACERVILLE - -

Date: _____

By:_____

Cleve Morris

City Manager

"City"

- - C O N S U L T A N T - -

Dated:_____

By:_____

"Consultant"

EXHIBIT "A"

Scope of Services

Consultant will provide the following services to the City:

EXHIBIT “B”

Schedule of Fees and Charges

ATTACHMENT D

LEGAL NOTICES & CONTRACT PROVISIONS

ATTACHMENT D

LEGAL NOTICES & CONTRACT PROVISIONS

BLAIRS LANE BRIDGE REPLACEMENT PROJECT (CIP 40604)

I. MODIFICATION OR WITHDRAWAL OF PROPOSAL

Any Proposal received prior to the date and time specified above for receipt or Proposals may be withdrawn or modified by written request of the Consultant. To be considered, the modification must be received in writing, and the same number of copies as the original Proposal, prior to the date and time specified above for receipt of Proposals.

RFP Addendum: Any changes to the RFP requirements will be made by written addenda by the City and shall be considered part of the RFP. Upon issuance, such addenda shall be incorporated into the agreement documents, and shall prevail over inconsistent provisions of earlier issued documentation and be forwarded to prospective Consultants. It will be the Consultants responsibility to assure that all addenda are incorporated into the Proposal as required according to all the terms and conditions for submittal of the Proposal. Any addendum will be posted on the cities website at least 72 hours prior to the RFP due date and time.

Verbal Agreement or Conversation: No prior, current, or post award verbal conversations or agreement(s) with any officer, agent, or employee of the City of Placerville shall affect or modify any terms or obligations of this RFP, or any contract resulting from this procurement.

Exceptions and Alternatives: Consultants may not, after exhausting protest avenues, take exception or make alterations to any requirement of the RFP. If alternatives or options are proposed, Consultant must clearly identify such. The City of Placerville expressly reserves the right in its sole discretion to consider such alternatives and to award a contract based thereon if determined to be in the best interest of the City.

Since the City desires to enter into one contract to provide all of the intended services, only those Proposals to provide all requested services will be considered responsive.

II. REJECTION OF PROPOSALS

Unauthorized conditions, limitations, or provisions attached to a Proposal may cause its rejection. It is recognized that each Proposer may have unique methods of service delivery. It is not the intention of this RFP to disqualify a Proposer due to variations in service delivery that do not affect quality or performance. Any Proposal offering professional services equivalent to or better than that requested will receive full consideration for award.

The City of Placerville reserves the right to reject any and all Proposals received, or to negotiate separately with any source in any manner necessary to serve the best interests of the City of Placerville.

The City of Placerville may elect not to award a contract and will not be responsible for any cost of Proposer associated with preparing the information solicited or obtained.

Non-acceptance of any responsive Proposal will not imply that the Proposal is deficient. Non-acceptance of any Proposal will mean that another accepted Proposal was deemed to be more advantageous to the City of Placerville.

All material submitted becomes the property of the City of Placerville and may be returned only at the City's option.

III. PROPOSAL AND CONSULTANT POLICIES

A. RFP as the Basis for Proposals

This RFP, including any addenda, will represent the most definitive statement the City of Placerville will make concerning information upon which Proposals are to be based. Any information, verbal or written, which is not contained in this RFP and addenda thereto, will not be considered by the City of Placerville in evaluating the Proposals.

B. Agency Right to Waive Minor Irregularities

The City of Placerville reserves the right to waive minor irregularities in the proposal process or to modify the selection process and timeline as it deems necessary.

C. Role of Consultant

The division of work among the selected Consultant and any proposed sub consultant is left to the selected Consultant to identify in assembling a project team. The selected Consultant will be responsible for management, design integration, scheduling, control, review and approval of all subcontract work and services for the total project. The selected Consultant will be responsible for the quality and timeliness of all subconsultant work and must coordinate all subconsultant activities. The selected Consultant must keep the City of Placerville apprised of any problems incurred and provide regular progress and budget reports. At The City of Placerville's direction, or as detailed in this RFP, the selected Consultant may be required to coordinate directly with other City of Placerville consultants and contractors.

The selected Consultant will be responsible for assuring that all subcontract work is in conformance with the project's policies, standards, and criteria. Use of any subconsultants not identified in the Proposal will be subject to prior approval by The City of Placerville.

D. Limitation and Award

The City of Placerville reserves the right to award multiple contracts.

This RFP does not commit the City of Placerville to award a contract. The City of Placerville reserves the right to reject all Proposals. If The City of Placerville rejects all Proposals, the project may be abandoned, re-advertised, or performed in any manner authorized under City ordinance and applicable law.

The contents of the successful Consultant's Proposal will be incorporated into the resulting contract. The City of Placerville's Sample Contract is included in this RFP. The City of Placerville reserves the right to rescind the contract award if the selected Consultant is unable or unwilling to enter into a contract substantially identical to the sample contract within 20 days from the date it is sent to the selected Consultant for execution.

As described in the RFP, the City of Placerville will evaluate the Proposals, establish a rank ordering of the qualified firms for the project, negotiate with the highest-ranked firm, and recommend award of the contract to the City Council.

Proposals will be made available, upon request, for copying or inspection when a recommendation is made for award of the resulting contract.

E. Debarred Bidders

Proposer, including any of its officers or holders of a controlling interest, is obligated to inform the City of Placerville whether or not it is or has been on any debarred bidders' list maintained by the State of California or any federal agency. Should Proposer be included on such a list during the performance of this project, it must inform the City of Placerville.

F. Disclosure of Proposal Information

Once submitted, Proposals become a matter of public record. Where a Proposer submits technical or business information that is claimed to be confidential, Proposer must so indicate by delineating each section of the Proposal with the heading "Confidential". The City of Placerville will give consideration to the claim of confidentiality. However, Proposers should understand that the City of Placerville has reservations as to whether any such information is exempt from disclosure under the California Public Records Act (Government Code Section 6250, et seq). The City of Placerville will notify a Proposer if it receives a request for release of information identified as confidential by Proposer. By submitting its Proposal, Proposer agrees that the City of Placerville will not be held liable for complying with the Public Records Act.

G. Use of RFP Ideas

The City of Placerville reserves the right to use any or all of Proposer's ideas as set forth in its Proposal. Selection or rejection of the Proposal does not affect this right.

H. Facilities and Resources

Proposer must furnish all equipment, facilities, labor, supervision, and any and all other required materials and services, except as set out in the Project Scope, or as otherwise specified in Consultant's Proposal. No City of Placerville resources in terms of personnel, facilities, or equipment will be provided unless agreed upon in writing.

IV. BID & PROPOSAL PROTEST PROCEDURE

A. Scope of Protest Procedure:

This Article specifies procedures for interested parties to protest the following City of Placerville staff actions:

1. A written recommendation to the City Council to disqualify a bidder, subcontractor, or proposer; and/or,
2. A written recommendation to the City Council to award a Contract to a particular bidder or proposer.

B. Effect of Protest on Contract Award or Bid Opening

When a protest has been properly filed prior to Contract award, the City Council will not award the Contract prior to issuance of a final decision on the protest. When a protest has been properly filed before the opening of bids, bids will not be opened prior to the City Council's decision on the protest.

C. Release of Protest Information

Materials submitted as a part of the protest resolution process will be available to the public except to the extent that:

1. The withholding of information is permitted or required by law or regulation; and
2. The information is designated proprietary by the person submitting the information to the City of Placerville. If the person submitting material to the City of Placerville indicates that the material contains proprietary material that should be withheld, a statement advising of this fact must be affixed to the front page of the material submitted, and the alleged proprietary information must be specifically identified in the body of the materials wherever it appears.

D. Maintenance of Protest Records

The City Manager or his/her designee will maintain a written record of each step taken in every bid or proposal protest. The record will list dates of each event and photocopies of all correspondence sent and/or received by the City of Placerville pertaining to the protest. These records will be retained for at least 3 years from the date each protest is resolved.

E. Who May File a Protest

Protests may be filed only by interested parties. Interested parties are defined as actual or prospective bidders or proposers for a City of Placerville contract and subcontractors or suppliers at any tier whose direct economic interest would be affected by an award or failure to amend a Contract, a provision of the specifications, or a bid or proposal submitted to the City of Placerville by a prime Consultant, or by the interpretation of the provisions of such documents. Submission of a bid or sub-bid protest will be deemed a waiver of any protest to any provision of the specifications which is not the subject of the protest, and entitle the bidder/proposer or sub-bidder/sub-consultant only to protest any subsequent recommendations/decisions of the City of Placerville staff, the City Manager, or the City Council to disqualify the bidder/proposer, reject its bid/proposal, or award the Contract.

F. Time For Filing a Protest

Protest to any particular provision of the specification must be received by the City of Placerville no later than 10 working days prior to the date established in the RFP as the deadline for the submittal of bids, proposals or qualifications. Protests of staff's recommendation to the City Council pertaining to the award of a Contract or the list of qualified proposers responding to an RFQ must be received by the City of Placerville no later than 10 working days from the date of the letter providing notice of the staff recommendation.

G. Form For Filing a Protest

Protests must be addressed to the Placerville City Manager, 3101 Center Street, Placerville, CA 95667. Protests must be in writing and contain a statement of the ground(s) for protest. At least 10 copies of the protest must be submitted by the protestor in the time and manner specified in this Article. The City Manager or his/her designee will provide notice, by telephone or by letter, to all bidders or proposers known to the City of Placerville for the Contract that is the subject of the protest. Such notice will state that a protest has been filed with the City of Placerville and identify the name of the protestor. The notice will be given not more than 5 working days after receipt of a properly filed protest. The notice will state that interested parties will receive further information relative to the protest only if they submit a written request to the City Manager.

H. The City of Placerville's Preliminary Response to a Protest

All City of Placerville responses to a protest will be issued in writing. The City Manager will designate a City staff person who, not more than 5 working days after receipt of a properly filed protest, will prepare and mail the following information to the protestor and all interested parties requesting such information:

1. A preliminary staff response to the protest including a brief explanation of the rationale supporting the response; and
2. The proposed time, date and place of the meeting at which the protestor and The City of Placerville staff will attempt to resolve the protest, if such a meeting is appropriate in the judgment of the City Manager.

Within 5 working days after the meeting, or if no meeting is scheduled, within 5 calendar days after the date the City of Placerville's response was mailed, the protestor must give the City Manager written notice that the protest is withdrawn or, alternatively, that the protestor requests further consideration of the protest.

If the protestor fails to deliver such notice to the office of the City Manager by the applicable deadline, the protest will be deemed withdrawn.

I. Further Investigation of Protest

If a protest is not withdrawn, the City Manager or his/her designee will further investigate the protest. The City Manager may contract for third-party consulting services to investigate a protest, when necessary. The City Manager may negotiate with the protestor and other interested parties to share the

cost of such consulting services. As part of the investigation, the City Manager or his/her designee will establish reasonable times when the City of Placerville, the protestor, and other interested parties will exchange all documents and arguments relevant to the protest.

Upon written request of the protestor, the City Manager may forward the protest and the City of Placerville's staff response to the City Council for decision without further investigation of the protest by the City Manager. If the City Manager elects to proceed without further investigation of the protest, the prior City of Placerville staff response will be the recommendation of the City Manager and the City Manager will proceed as set out in J. City Manager's Recommendation or Decision.

J. City Manager's Recommendation or Decision

Following investigation, the City Manager will distribute to the protestor, and all interested parties requesting such information, either a written decision, if the City Manager is awarding authority, or a written recommendation that the City Manager will submit to the City Council to resolve the protest, if the City Council is the awarding authority. The City Manager's written decision is final. Within 5 working days after the date of the letter transmitting the City Manager's recommendation on the protest, the protestor must notify the City Manager in writing whether that the protest is withdrawn or that the protestor requests the protest continue to the City Council for decision. If the protestor fails to submit such a notice, the protest will be deemed to be withdrawn and all proceedings will cease.

K. Submittal of Protest to the City Council

If the protest is continued to the City Council for resolution, the protestor, and all interested parties requesting such information, will be notified of the date, time and place of the City Council's hearing at which the protest will be considered; and the date that the protestor and other interested parties must submit written comments with respect to the recommendation. The date established by the City Manager for submittal of comments by the protestor and other persons will allow a reasonable period for rebuttal and may vary according to the complexity of the particular protest.

A copy of the agenda package sent to City Council members prior to a protest hearing will be sent to the protestor and sent or made available to any interested person at least 5 working days before the hearing and will include the City Council's recommendation and all written comments received from the protestor and other persons within the submittal period. If the City Manager has revised his/her recommendation since its distribution, a written description of the new intended decision and the reason(s) for revision will be sent to the protestor and sent or otherwise made available to any interested person.

L. City Council's Decision

At the City Council meeting scheduled for the protest hearing, the City Council, in its discretion, may conduct the hearing and/or continue the hearing to a subsequent City Council meeting, or hire an impartial hearing officer to conduct a hearing and prepare a written recommended decision including findings of fact.

At the hearing, the Mayor may announce procedural rules, including those that are reasonably necessary to preclude repetitious or irrelevant testimony. The City of Placerville staff, the protestor, and any interested person may present evidence relating to the protest. If either party arranges for the use of a court reporter to transcribe the hearing, the other party must share the cost of transcribing the hearing if it requests a copy of the transcript.

If an impartial hearing officer conducts the hearing, the City will provide written notice to the protestor, and all interested parties requesting such information, of the date, time and place of the City Council meeting at which the hearing officer's recommendation will be considered for adoption, and the date that the protestor must provide written comments for submittal to the City Council. A copy of the documents pertaining to the protest that is provided to the City Council with its meeting agenda will be sent to the protestor at least 5 days before the meeting.

In rendering its decision on the protest, the City Council, in its discretion, may adopt the decision recommended by the City Manager, adopt the written recommendation and findings of fact prepared by a hearing officer, or adopt a separate decision. The protestor and all interested parties will be notified in writing of the final decision of the City Council within 30 calendar days from the date of the City Council meeting.

M. Waiver of Damages

By submitting a bid/proposal or sub-bid/sub-proposal, each bidder/proposer and sub-bidder/sub-proposer agrees that in the event that it submits any protest to the terms of the specifications or to any subsequent decision of the City of Placerville staff, City Manager or City Council, it waives damages as provided for herein. The City of Placerville retains the discretion to reject all bids/proposals or to make no decision whatsoever. If the City of Placerville City Manager or City Council rejects all bids/proposals for any reason, or overrules any protest and awards the Contract, the protesting entity waives all claims, rights and causes of action for loss of anticipated profits from the Contract or any subcontract, regardless of whether the City of Placerville's decision is subsequently invalidated by a court of law. The City of Placerville will be deemed to have relied to its detriment on such waiver in deciding either to reject all bids/proposals or to award the Contract. Any attempted reservation of rights waived herein will be grounds to reject a bid as nonresponsive.

ATTACHMENT E

100% PLANS – NOT FOR CONSTRUCTION

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
03	ED	BLAIRS LN			

CITY OF PLACERVILLE

ENGINEERING DIVISION

PROJECT PLANS FOR CONSTRUCTION ON

BLAIRS LANE BRIDGE REPLACEMENT IN CITY OF PLACERVILLE

PROJECT No. 40604
FEDERAL-AID BRIDGE REPLACEMENT
FEDERAL PROJECT No. BRLO 5015 (009)

To be supplemented by State of California Standard Plans dated May 2010

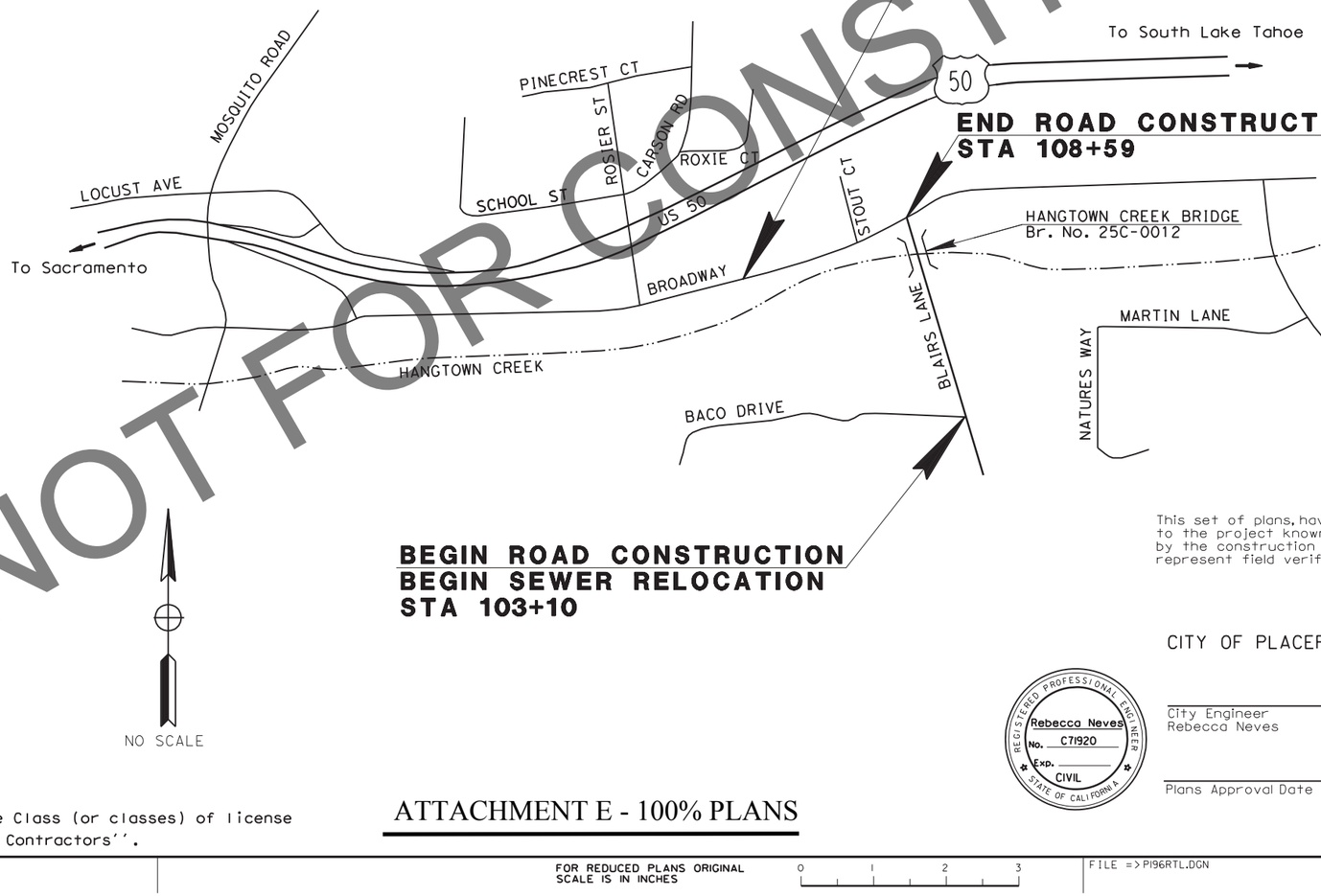
INDEX OF PLANS

SHEET No.	DESCRIPTION
1	TITLE SHEET
2-3	TYPICAL CROSS SECTIONS
4	LAYOUT
5	PROFILE
6-11	CONSTRUCTION DETAILS
12	CONTOUR GRADING
13	EROSION CONTROL QUANTITIES
14	DRAINAGE PLAN
15-18	DRAINAGE PROFILE
19-20	DRAINAGE DETAILS
21-22	DRAINAGE QUANTITIES
23	UTILITY PLAN
24-25	SEWER AND WATER PLAN AND PROFILE
26	PRESSURE REDUCING VALVE
27	SEWER AND WATER NOTES AND DETAILS
28	CONSTRUCTION AREA SIGNS
29-32	TRAFFIC HANDLING
33	TRAFFIC HANDLING QUANTITIES
34	PAVEMENT DELINEATION AND SIGN PLAN
35-36	PAVEMENT DELINEATION AND SIGN QUANTITIES
37	TREE PLANTING PLAN
38-40	SUMMARY OF QUANTITIES

STRUCTURE PLANS

41-58	HANGTOWN CREEK BRIDGE No. 25C-0012 & RETAINING WALL PLANS

THE STANDARD PLANS LIST APPLICABLE TO THIS CONTRACT IS INCLUDED IN THE NOTICE TO BIDDERS AND SPECIAL PROVISIONS BOOK.



100% SUBMITTAL

PROJECT PLANS FOR CONSTRUCTION ON BLAIRS LANE FOR HANGTOWN CREEK BRIDGE REPLACEMENT

NOT FOR CONSTRUCTION

This set of plans, having been reviewed by me, reflect all approved revisions to the project known to me, and all field deviations to the planned improvements by the construction contractor, as reported to me as of . It does not represent field verification of planned improvements by me.

CITY OF PLACERVILLE

City Engineer
Rebecca Neves

Plans Approval Date

Project Engineer Date
Registered Civil Engineer

Plans Approval Date

REGISTERED PROFESSIONAL ENGINEER — Rebecca Neves — No. C71920 — Exp. — CIVIL — STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER — C. Davis — No. C58440 — Exp. 12/31/16 — CIVIL — STATE OF CALIFORNIA

PROJECT ENGINEER	DATE	PROJECT MANAGER	DATE
C. DAVIS		S. MELLON	

The Contractor shall possess the Class (or classes) of license as specified in the ''Notice to Contractors''.

ATTACHMENT E - 100% PLANS

QUINCY ENGINEERING, INC
11017 Cobblerock Drive
Rancho Cordova, CA 95670

Contract No 40604

LAST REVISION 00-00-00
DATE PLOTTED => 3/11/2015
TIME PLOTTED => 5:15:37 PM

FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

FILE => PI96RTL.DGN

CU 00000

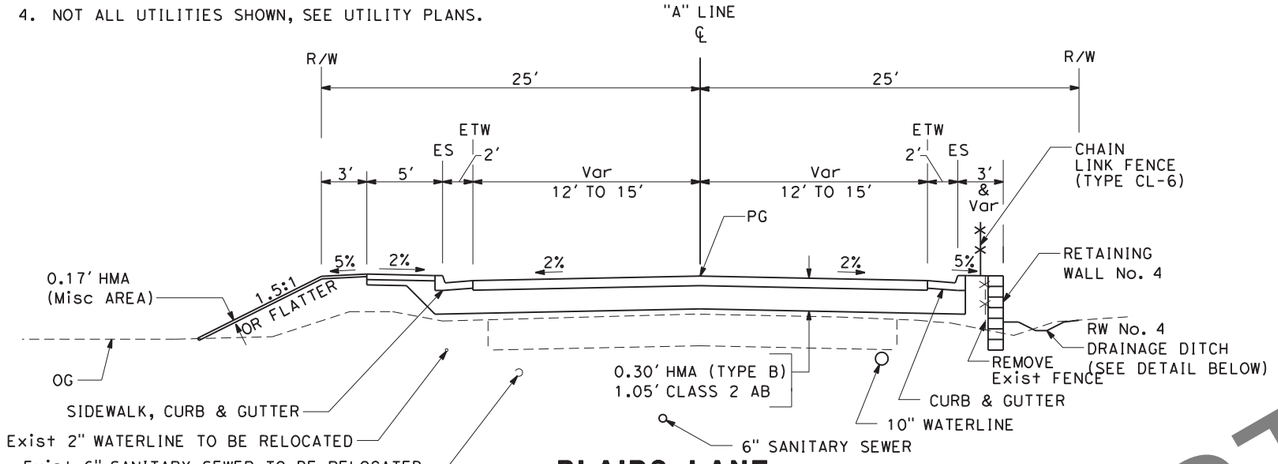
EA 000000

NOTES:

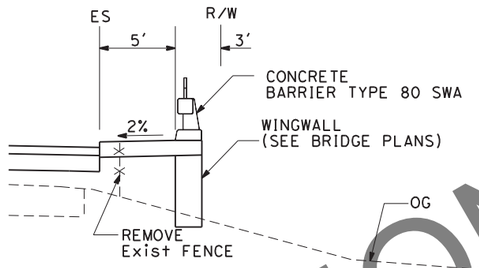
1. DIMENSIONS OF THE STRUCTURAL SECTIONS ARE SUBJECT TO TOLERANCES SPECIFIED IN THE STANDARD SPECIFICATIONS.
2. SUPERELEVATION AS SHOWN OR AS DIRECTED BY THE ENGINEER.
3. FOR SIDEWALK, CURB & GUTTER; CURB & GUTTER; AND CONCRETE WHEEL STOP DETAILS, SEE CONSTRUCTION DETAILS.
4. NOT ALL UTILITIES SHOWN, SEE UTILITY PLANS.

DESIGN DESIGNATION (ROUTE BLAIRS Ln)

1998 ADT = 500
2027 ADT = 2000
T.I. = 8.0 V = 25 MPH



BLAIRS LANE
STA "A" 105+87.76 TO "A" 106+95.00 (BB)



BLAIRS LANE
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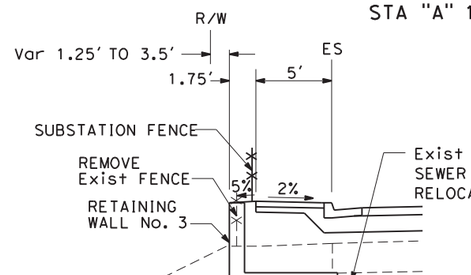
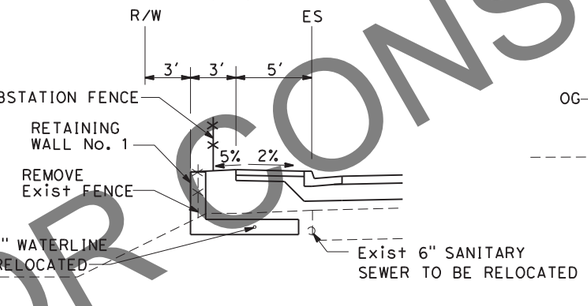
STA "A" 106+88.02 TO "A" 106+95.00 (EB) (LEFT SIDE)

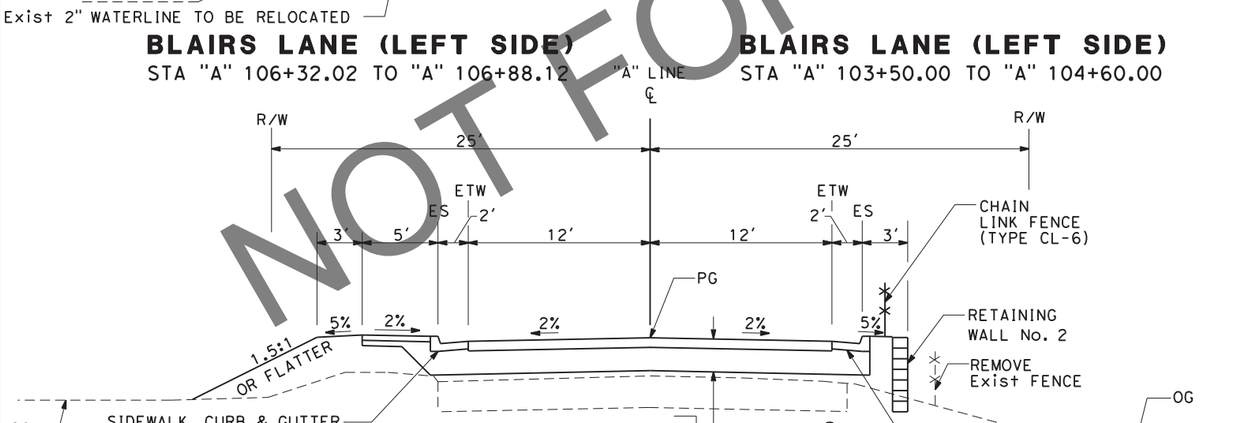


BLAIRS LANE (LEFT SIDE)
STA "A" 106+32.02 TO "A" 106+88.12



BLAIRS LANE (LEFT SIDE)
STA "A" 103+50.00 TO "A" 104+60.00

CALTRANS DRIVEWAY
STA "C" 2+22.54 TO 2+71.50



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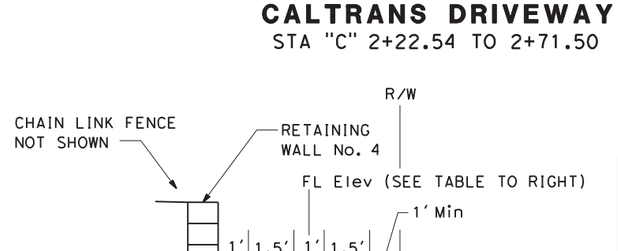


RW No. 4 DRAINAGE DITCH DETAIL

ADDITIONAL DATA	
STATION "A" LINE	FL ELEVATION
106+20.00	1925.15
106+30.00	1924.81
106+40.00	1924.72

TYPICAL CROSS SECTIONS
NO SCALE

X-1

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
03	ED	BLAIRS LN			

100% SUBMITTAL
REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — C. Davis — No. C58440 — Exp. 12/31/16 — CIVIL — STATE OF CALIFORNIA

The Identity or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

QUINCY ENGINEERING, INC
11017 Cobblerock Drive
Rancho Cordova, CA 95670

NOT FOR CONSTRUCTION

CALCULATED/ DESIGNED BY	DATE	REVISED BY	DATE REVISED
CHECKED BY	VFD 05/07	MRR	4/12
XX	XX/0X	PSK	7/13

PROJECT ENGINEER: CAROLYN DAVIS

AGENCY NAME: CITY OF PLACERVILLE DEPARTMENT OF PUBLIC WORKS

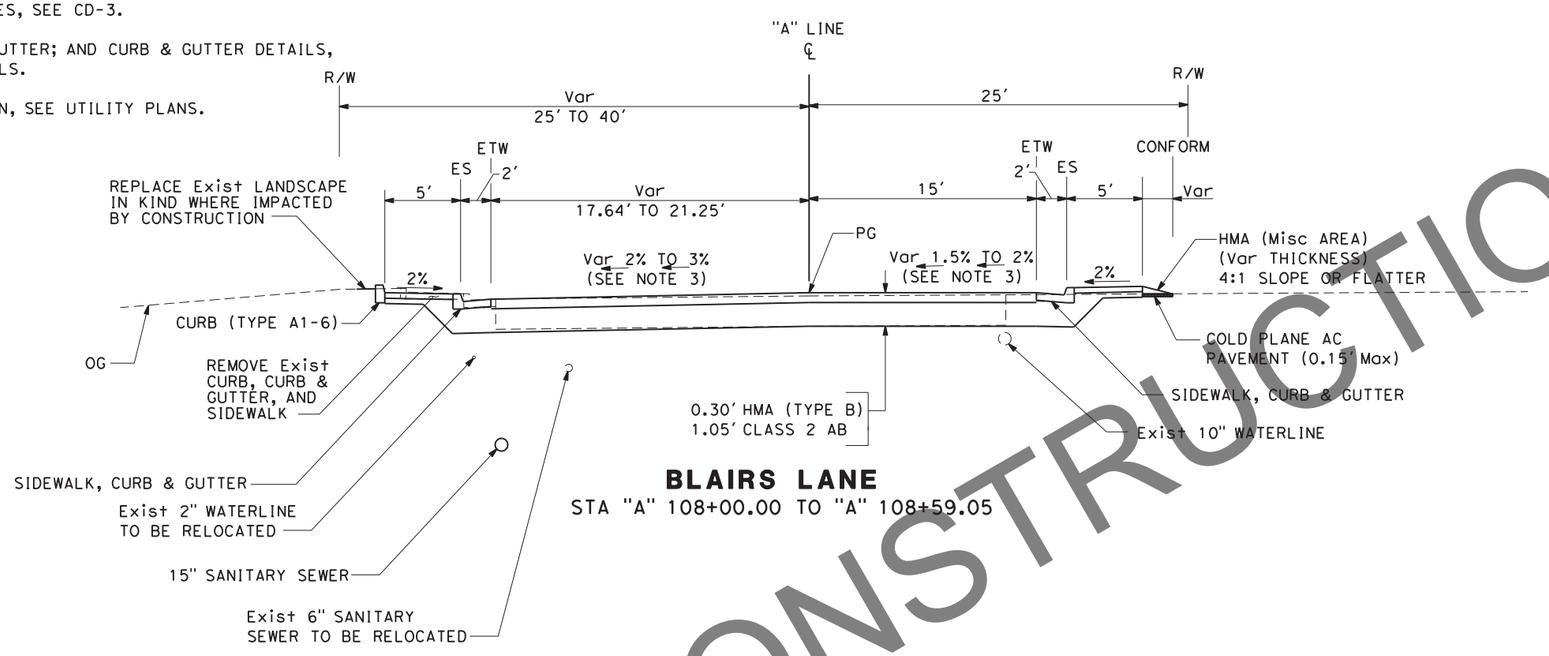
LAST REVISION 00-00-00 | DATE PLOTTED => 3/11/2015 | TIME PLOTTED => 4:00:29 PM

FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

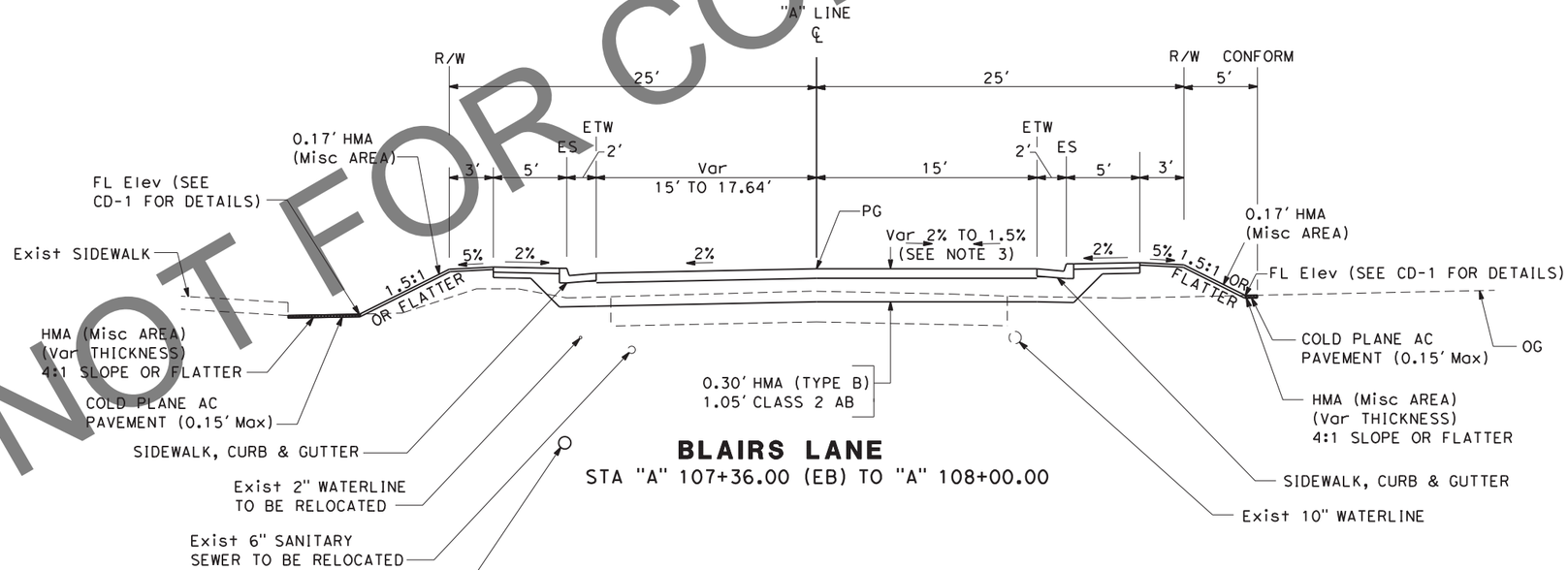
FILE => s:\Client\PLACERV\p07-300\CAD\pl96r\pl96rtx.dgn | CU 00000 | EA 000000

NOTES:

1. DIMENSIONS OF THE STRUCTURAL SECTIONS ARE SUBJECT TO TOLERANCES SPECIFIED IN THE STANDARD SPECIFICATIONS.
2. SUPERELEVATION AS SHOWN OR AS DIRECTED BY THE ENGINEER.
3. FOR ACTUAL CROSS SLOPES, SEE CD-3.
4. FOR SIDEWALK, CURB & GUTTER; AND CURB & GUTTER DETAILS, SEE CONSTRUCTION DETAILS.
5. NOT ALL UTILITIES SHOWN, SEE UTILITY PLANS.



BLAIRS LANE
STA "A" 108+00.00 TO "A" 108+59.05



BLAIRS LANE
STA "A" 107+36.00 (EB) TO "A" 108+00.00

NOT FOR CONSTRUCTION

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
03	ED	BLAIRS LN			

100% SUBMITTAL
REGISTERED CIVIL ENGINEER

REGISTERED PROFESSIONAL ENGINEER — C. Davis, No. C58440, Exp. 12/31/16, CIVIL, STATE OF CALIFORNIA

PLANS APPROVAL DATE

The Identity or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

QUINCY ENGINEERING, INC
11017 Cobblerock Drive
Rancho Cordova, CA 95670

CALCULATED/ DESIGNED BY	CHECKED BY	VFD	DATE	REVISED BY	DATE REVISED
		XX	05/07	XX/0X	
				MRR	4/12
				PSK	7/13

PROJECT ENGINEER: CAROLYN DAVIS

AGENCY NAME: CITY OF PLACERVILLE DEPARTMENT OF PUBLIC WORKS

TYPICAL CROSS SECTIONS
NO SCALE

X-2

LAST REVISION 00-00-00 | DATE PLOTTED => 3/11/2015 | TIME PLOTTED => 4:04:07 PM

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CU 00000 | EA 000000

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
03	ED	BLAIRS LN			

100% SUBMITTAL

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — C. Davis — No. C58440 — Exp. 12/31/16 — CIVIL — STATE OF CALIFORNIA

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QUINCY ENGINEERING, INC
11017 Cobblerock Drive
Rancho Cordova, CA 95670

CALCULATED/ DESIGNED BY	CHECKED BY	VFD	DATE	REVISED BY	DATE REVISED
		XX	05/07	XX/0X	
				MRR	4/12
				PSK	7/13

PROJECT ENGINEER
CAROLYN DAVIS

AGENCY NAME
CITY OF PLACERVILLE DEPARTMENT OF PUBLIC WORKS

NOTES:

1. FOR COMPLETE RIGHT OF WAY DATA, SEE RIGHT OF WAY RECORD MAPS AT COUNTY OFFICE.

21.21' LT "A" 103+12.08
BEGIN SIDEWALK, CURB & GUTTER
CONFORM TO Exist CURB RAMP

25.72' LT "A" 103+17.28
BEGIN REMOVE SIDEWALK
BEGIN REMOVE CURB

20.64' LT "A" 103+24.12
END REMOVE SIDEWALK
END REOMVE CURB

UTILITY EASEMENT

12.00' LT "A" 103+32.23

PRS (SEE SEWER & WATER PLANS)
APN 004-260-025
PG&E YARD

TOE OF FILL
RETAINING WALL No. 1
(SEE RETAINING WALL PLANS)
TCE
22.00' LT "A" 105+34.90
TOE OF FILL
R/W

P/L
APN 004-271-012

BACO DRIVE

12.00' LT "A" 106+19.22

"A" 105+87.76 =
"C" 2+00.00

RESET POST AND RELOCATE GATE

TO
FROM
PG&E Dwy
RESET GATE

TOE OF FILL

REMOVE Exist BRIDGE
(SEE BRIDGE PLANS)
BRIDGE No. 25C-0012

"A" 106+95.00
BEGIN BRIDGE

15.00' LT "A" 106+88.12
END SIDEWALK, CURB & GUTTER
BEGIN Conc BARRIER TYPE SW (Mod)

RETAINING WALL No. 3
(SEE RETAINING WALL PLANS)

PEDESTRIAN BARRICADE

P/L
Hangtown Creek

REMOVE GUARD RAIL PORTION

15.00' LT "A" 107+53.48
BEGIN SIDEWALK, CURB & GUTTER
END Conc BARRIER TYPE SW (Mod)

SEE SHEET CD-1 FOR DETAILS

APN 004-260-024
GAS STATION

BROADWAY

44.89' LT "A" 108+51.32
END SIDEWALK, CURB & GUTTER
CONFORM TO Exist

TCE
15.00' LT "A" 107+75.11
"A" 108+59.05
CONFORM

R/W

103+00 — N 16°40'27" W 806.37' — 104+00 — 105+00 — 106+00 — 107+00 — 108+00

BLAIRS LANE

12'
ES
LIP OF GUTTER
"A" LINE
MODIFY IRRIGATION AS NECESSARY
12.00' RT "A" 106+02.03
13.55' RT "A" 106+48.55
15'
COMMERCIAL Dwy
LIP OF GUTTER

TO ESKATON VILLAGE

CP20
CP51

REMOVE 10" OAK

RETAINING WALL No. 2
(SEE RETAINING WALL PLANS)
TREES TO REMAIN
REMOVE 18" OAK

"A" 103+10.00
CONFORM

12.00' RT "A" 103+35.88
10.94' RT "A" 103+25.87
BEGIN CURB & GUTTER
19.41' LT "A" 103+10.00
PAVEMENT CONFORM

P/L
APN 049-340-020

24' GATE
2+50
"C" LINE

RETAINING WALL No. 4
(SEE RETAINING WALL PLANS)

"A" 107+36.00
END BRIDGE

DITCH + LIMITS
Exist TREES TO REMAIN
30.71' LT "C" 2+51.22
END DETACHED SIDEWALK
MODIFY IRRIGATION AS NECESSARY

REMOVE CONCRETE CHECK DAM
TCE

15.00' RT "A" 108+41.62
END SIDEWALK, CURB & GUTTER

15.00' RT "A" 107+46.52
BEGIN SIDEWALK, CURB & GUTTER
END Conc BARRIER TYPE SW (Mod)

15.00' RT "A" 106+78.62
END CURB & GUTTER
BEGIN Conc BARRIER TYPE SW (Mod)

UTILITY EASEMENT

APN 004-130-038
GAS STATION

CALTRANS Dwy
TOE OF FILL
22' GATE
N 85°56'29" E 100.00'
"C" 2+71.50
CONFORM
FOR DETAILS SEE SHEET CD-1

APN 004-131-035
CALTRANS YARD

26.72' LT "C" 2+50.91
END DETACHED SIDEWALK

26.77' LT "C" 2+97.47
BEGIN DETACHED SIDEWALK
CONFORM

22.78' LT "C" 2+97.14
BEGIN DETACHED SIDEWALK
CONFORM

Exist TREE TO REMAIN

P/L

APN 004-130-037

P/L

ABBREVIATIONS

TCE	TEMPORARY CONSTRUCTION EASEMENT
R/W	RIGHT OF WAY
P/L	PROPERTY LINE

LEGEND

FENCE
RETAINING WALL
R/W
TCE
P/L
TOE OF FILL LIMITS
COLD PLANE
CPXX — SURVEY CONTROL POINT

SURVEY CONTROL DATA

No.	NORTHING	EASTING	ELEV	LINE	STATION	OFFSET	DESCRIPTION
11	2101717.97	6861717.40	1923.79	"A"	108+27.77	152.22' LT	¾" CAPPED IRON PIPE
20	2101243.80	6862038.23	1953.23	"A"	102+81.47	19.06' RT	¾" OPEN IRON PIPE
44	2101654.70	6862150.92	1925.35	"A"	106+42.76	244.90' RT	1" CAPPED IRON PIPE
51	2101795.91	6861869.73	1925.74	"A"	108+58.72	16.06' RT	1¼" CAPPED IRON PIPE

NOT FOR CONSTRUCTION

LAYOUT
1" = 20'

L-1

LAST REVISION	DATE PLOTTED => 3/11/2015
00-00-00	TIME PLOTTED => 3:56:04 PM

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CU 00000

EA 000000

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
03	ED	BLAIRS LN			

100% SUBMITTAL

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — C. Davis — No. C58440 — Exp. 12/31/16 — CIVIL — STATE OF CALIFORNIA

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11017 Cobblerock Drive
Rancho Cordova, CA 95670

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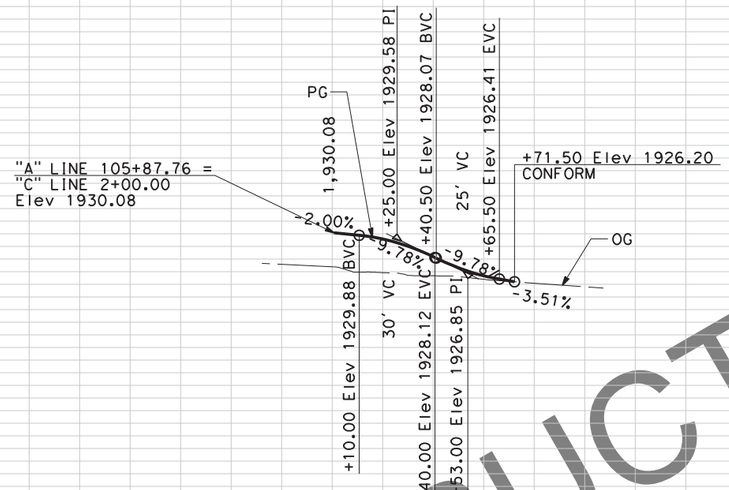
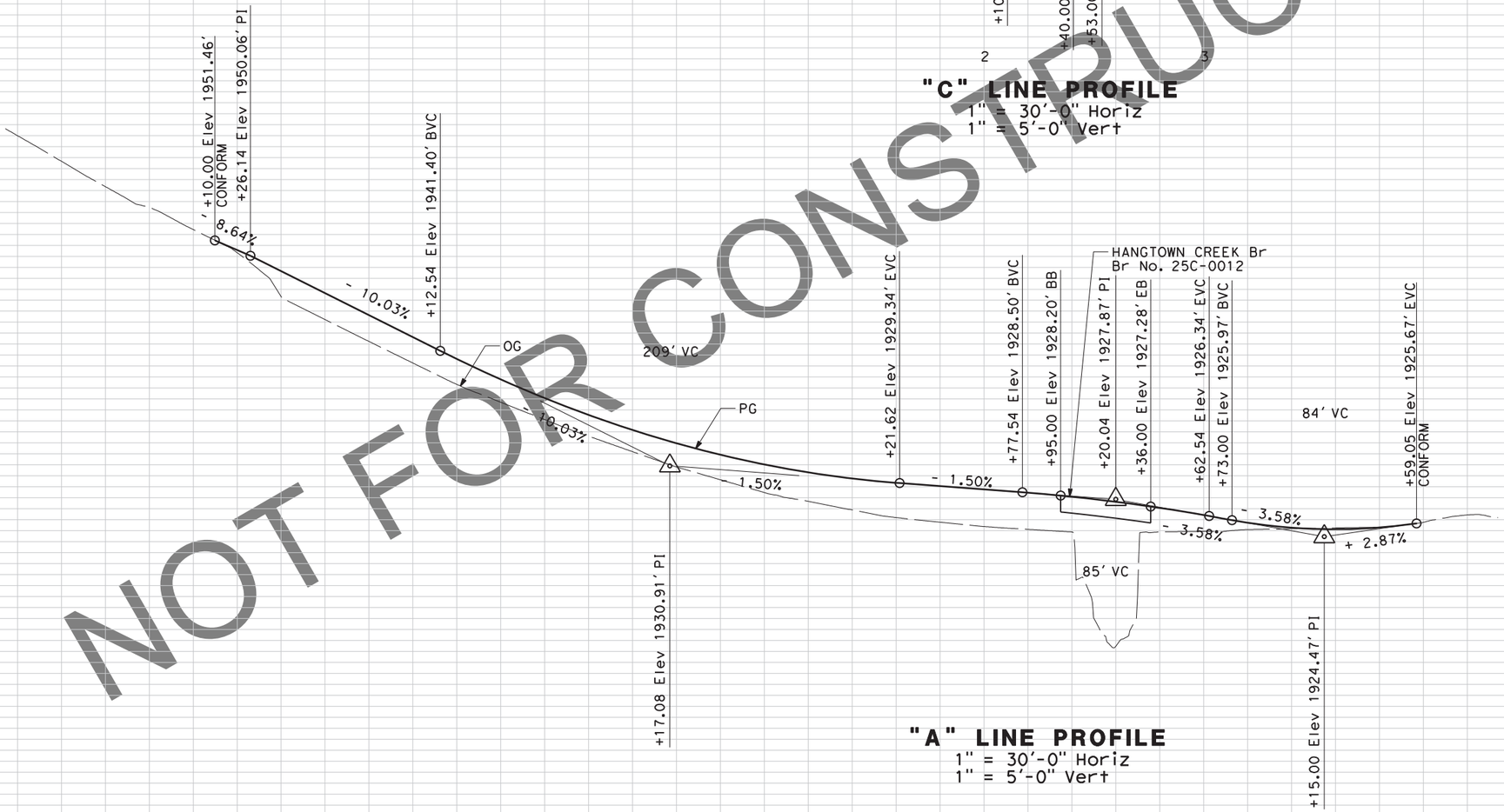


"C" LINE PROFILE
1" = 30'-0" Horiz
1" = 5'-0" Vert



"A" LINE PROFILE
1" = 30'-0" Horiz
1" = 5'-0" Vert

PROFILE
SCALE AS SHOWN **PR-1**

Station	102	103	104	105	106	107	108	109	110
CY Exc									
CY Emb									

1940 1930 1920 1965 1960 1955 1950 1945 1940 1935 1930 1925 1920 1915 1910

DATE	REVISED BY	MRR	PSK
05/07	DATE REVISED	4/12	7/13
XX/XX			

CALCULATED/DESIGNED BY: VFD XX
CHECKED BY: XX

AGENCY NAME: CITY OF PLACERVILLE DEPARTMENT OF PUBLIC WORKS
PROJECT ENGINEER: CAROLYN DAVIS

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DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
03	ED	BLAIRS LN			

100% SUBMITTAL

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PLANS APPROVAL DATE

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QUINCY ENGINEERING, INC
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CHECKED BY	VFD 05/07	PSK	7/13
XX	XX/XX	MRR	4/12

PROJECT ENGINEER
CAROLYN DAVIS

AGENCY NAME
CITY OF PLACERVILLE DEPARTMENT OF PUBLIC WORKS

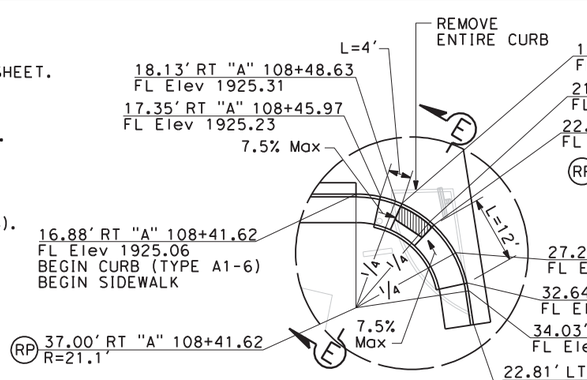
NOTES:

1. FOR SECTION A-A, B-B AND C-C DETAILS, SEE CD-3 SHEET.
2. SEE CD-2 SHEET FOR COMMERCIAL DRIVEWAY DETAILS.
3. FOR SECTION D-D AND E-E DETAILS, SEE CD-2 SHEET.

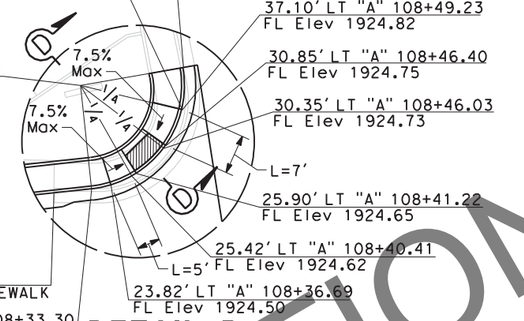
LEGEND:

COLD PLANE AC PAVEMENT (0.15' Max) AND RESURFACE (SEE CD-3 FOR DETAILS).

(RP) RADIAL POINT



DETAIL A
NO SCALE



DETAIL B
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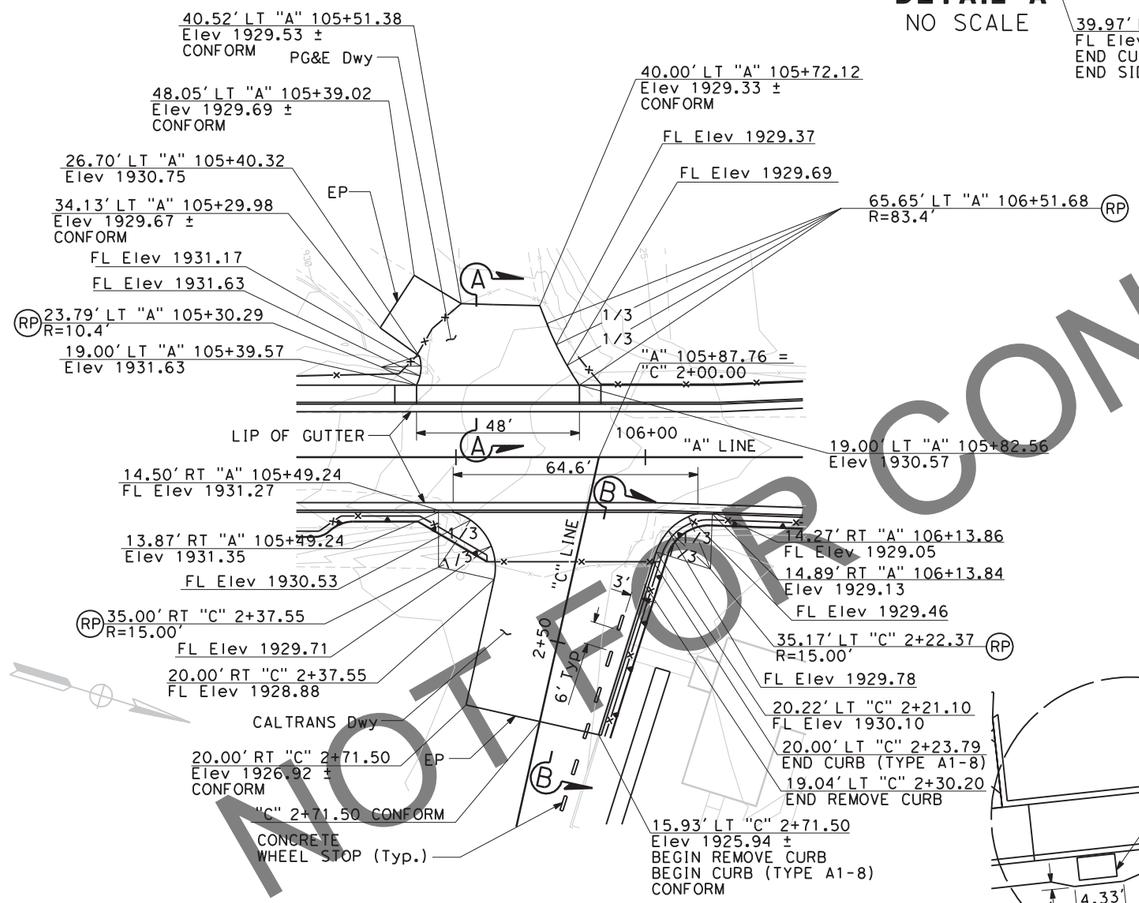
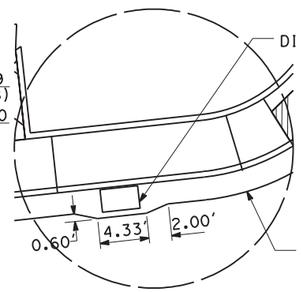


PG&E DRIVEWAY &
"C" LINE CALTRANS DRIVEWAY



DETAIL C
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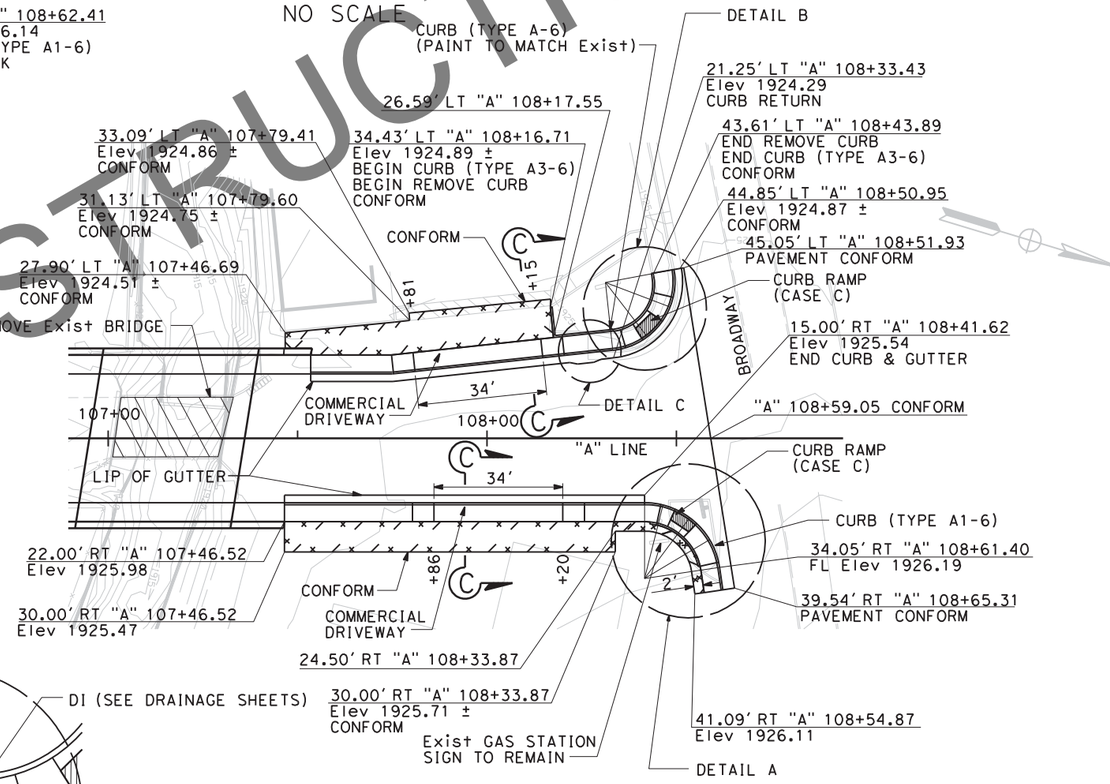

"A" LINE
BLAIRS LANE

FL ELEVATIONS (LEFT SIDE)			
LINE	STATION	OFFSET	ELEVATION
"A"	107+60.00	27.16'	1924.98
"A"	107+70.00	27.42'	1924.45
"A"	107+80.00	29.40'	1924.66
"A"	107+90.00	34.12'	1924.71
"A"	108+00.00	35.09'	1924.76
"A"	108+10.00	36.07'	1924.88

FL ELEVATIONS (RIGHT SIDE)			
LINE	STATION	OFFSET	ELEVATION
"A"	107+50.00	28.00'	1924.60
"A"	107+60.00	28.00'	1924.93
"A"	107+70.00	29.00'	1925.11
"A"	107+80.00	29.00'	1925.16
"A"	107+90.00	30.00'	1925.21
"A"	108+00.00	30.00'	1925.35
"A"	108+10.00	30.00'	1925.49
"A"	108+20.00	30.00'	1925.54

CONSTRUCTION DETAILS

1" = 20'

CD-1

NOT FOR CONSTRUCTION

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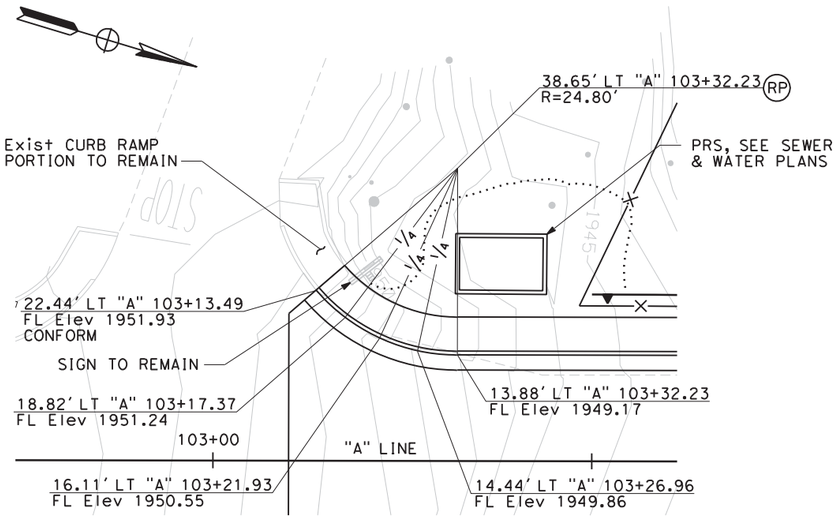
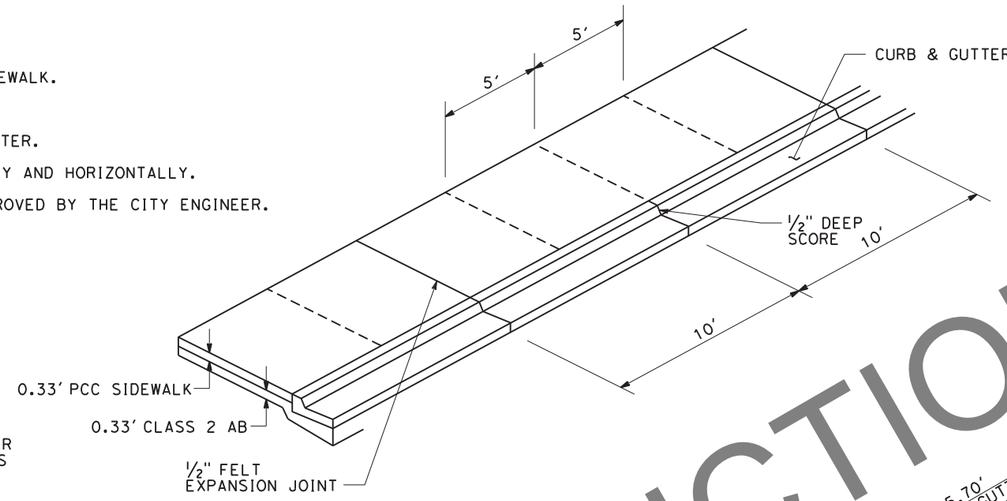
CU 00000 EA 000000

NOTES:

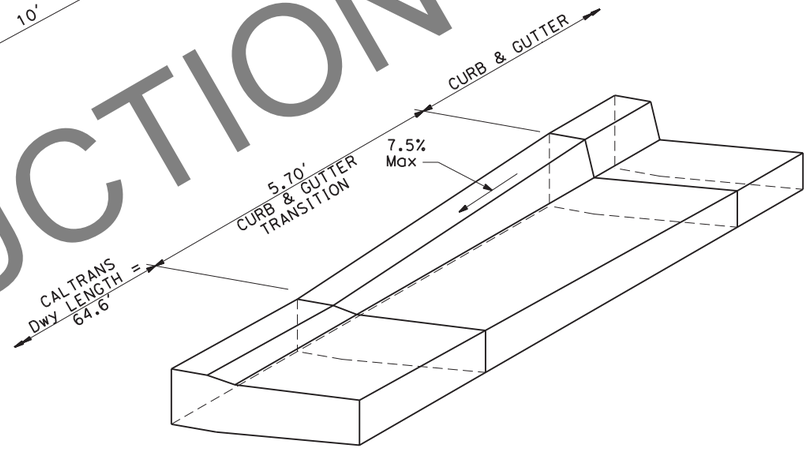
1. FOR SECTION D-D AND E-E LOCATION, SEE CD-1 SHEET.
2. DISTANCE BETWEEN SCORE LINES NOT TO EXCEED 5' IN LONGITUDINAL DIRECTION IN SIDEWALK.
3. ½" TRANSVERSE EXPANSION JOINTS AT 20' INTERVALS FOR SIDEWALK.
4. EXPANSION JOINTS IN SIDEWALK TO BE ADJACENT TO EXPANSION JOINTS IN CURB & GUTTER.
5. ALL EXPANSION JOINTS SHALL EXTEND COMPLETELY THROUGH CONCRETE BOTH VERTICALLY AND HORIZONTALLY.
6. DRIVEWAY APPROACH SHALL BE POURED SEPARATELY FROM CURB UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.
7. FELT EXPANSION JOINT AT MID POINT OF DRIVEWAY.
8. FOR ADDITIONAL INFORMATION NOT SHOWN, SEE CD-4.



CURB & GUTTER AT BLAIRS LANE/BACO DRIVE

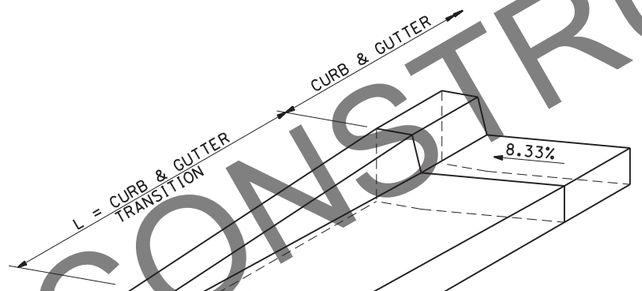


ATTACHED SIDEWALK DETAIL

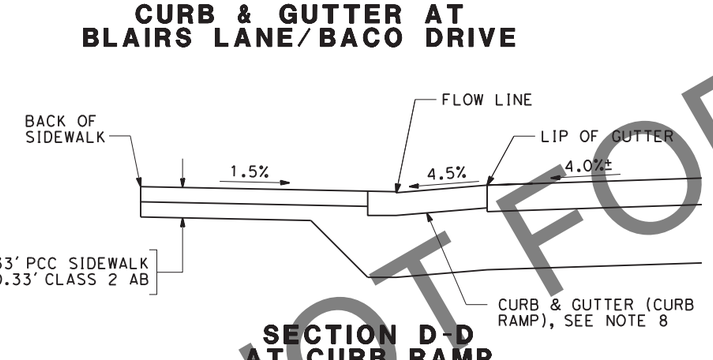


CALTRANS DRIVEWAY CURB & GUTTER TRANSITION

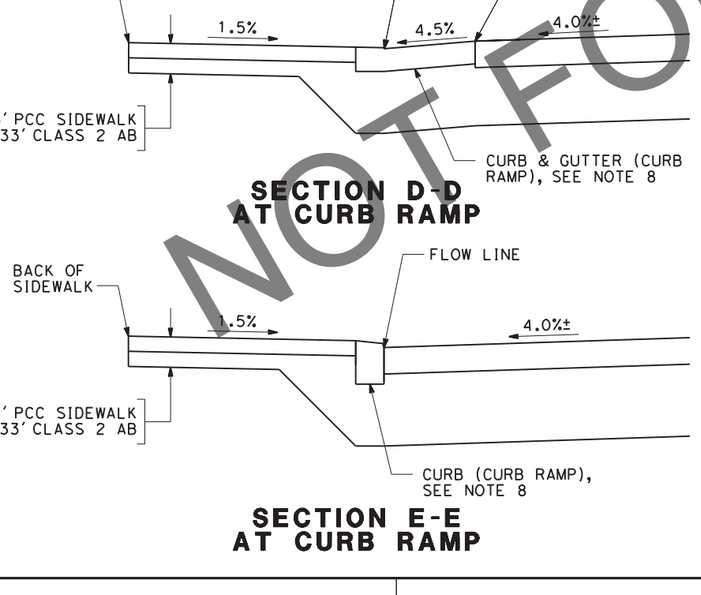
SEE NOTES 6 & 7



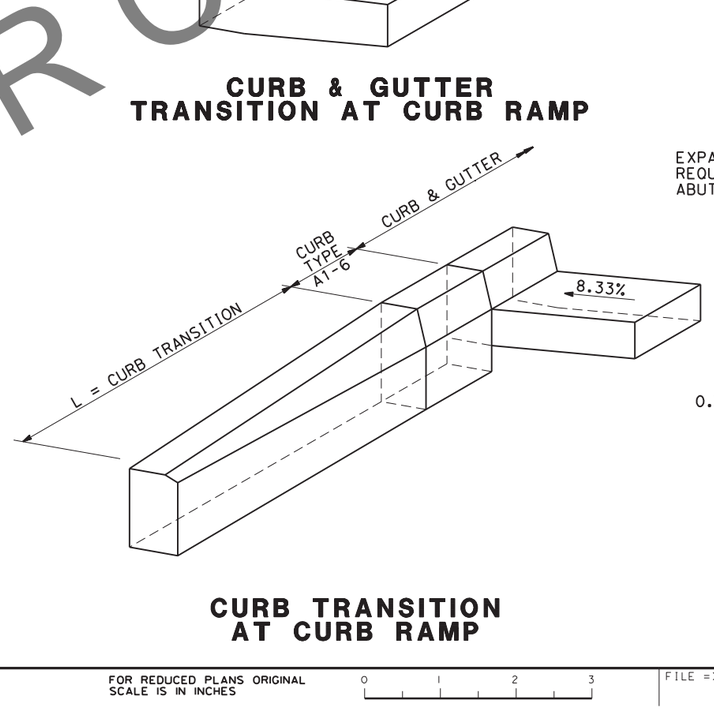
CURB & GUTTER TRANSITION AT CURB RAMP



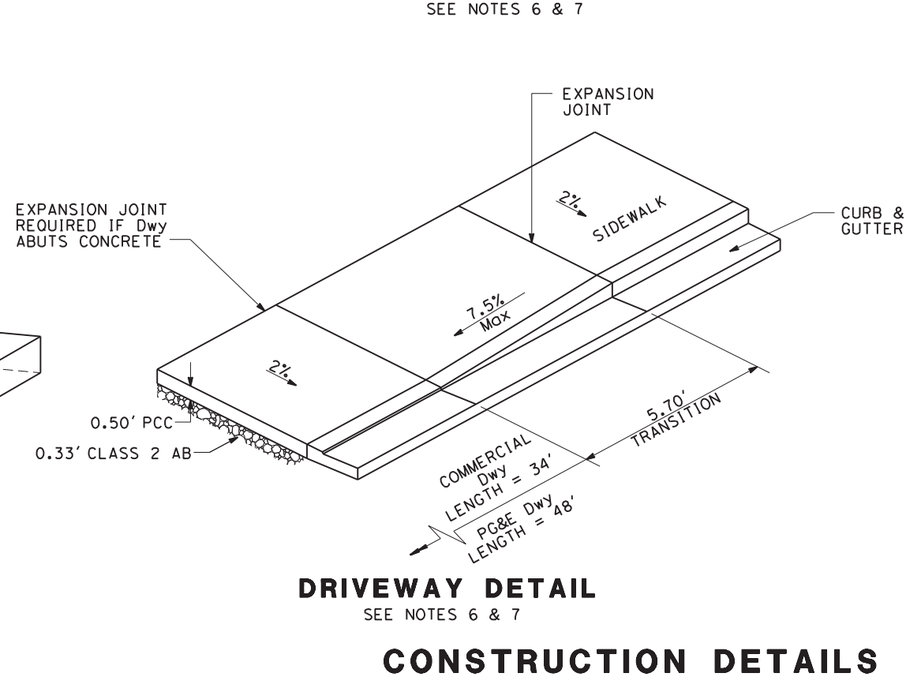
SECTION D-D AT CURB RAMP



SECTION E-E AT CURB RAMP



CURB TRANSITION AT CURB RAMP



DRIVEWAY DETAIL

SEE NOTES 6 & 7

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
03	ED	BLAIRS LN			

100% SUBMITTAL

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — C. Davis — No. C58440 — Exp. 12/31/16 — CIVIL — STATE OF CALIFORNIA

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QUINCY ENGINEERING, INC
11017 Cobblerock Drive
Rancho Cordova, CA 95670

NOT FOR CONSTRUCTION

CALCULATED/ DESIGNED BY	CHECKED BY	DATE	REVISED BY	DATE REVISED
VFD	XX	05/07	XX/XX	
MRR	PSK	4/12		7/13

PROJECT ENGINEER: CAROLYN DAVIS

AGENCY NAME: CITY OF PLACERVILLE DEPARTMENT OF PUBLIC WORKS

CONSTRUCTION DETAILS

NO SCALE

CD-2

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CU 00000 | EA 000000

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
03	ED	BLAIRS LN			

100% SUBMITTAL

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CALCULATED/ DESIGNED BY	DATE	REVISED BY	DATE REVISED
CHECKED BY	VFD 05/07	MRR	4/12
XX	XX/0X	PSK	7/13

PROJECT ENGINEER: CAROLYN DAVIS

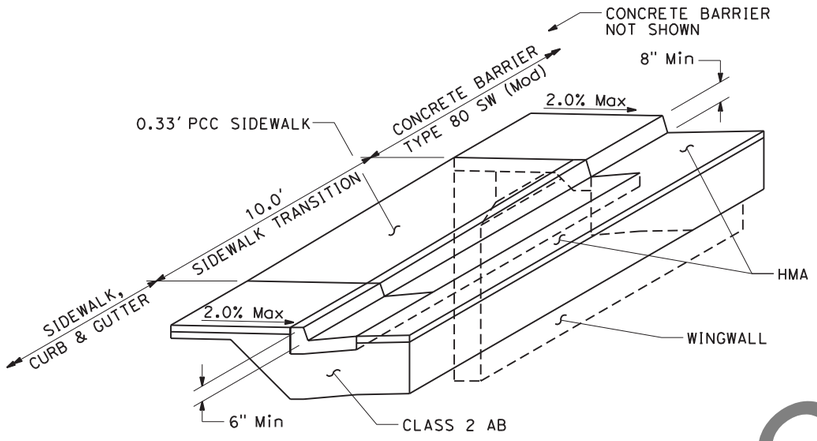
AGENCY NAME: CITY OF PLACERVILLE DEPARTMENT OF PUBLIC WORKS

RIGHT SIDE ELEVATION DATA

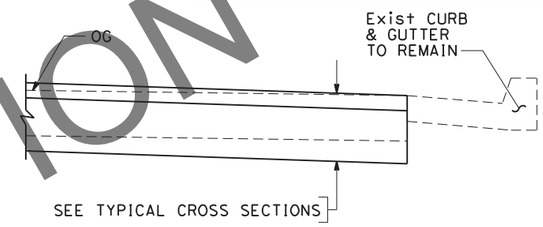
STATION	OFFSET	CROSS SLOPE	ELEVATION	DESCRIPTION
103+30.00	11.37′	0.0239	1949.95	LIP OF GUTTER
103+40.00	12.00′	0.0176	1948.88	LIP OF GUTTER
103+50.00	12.00′	0.0113	1947.80	LIP OF GUTTER
103+60.00	12.00′	0.0051	1946.73	LIP OF GUTTER
103+70.00	12.00′	-0.0012	1945.65	LIP OF GUTTER
103+80.00	12.00′	-0.0075	1944.57	LIP OF GUTTER
103+90.00	12.00′	-0.0200	1943.49	LIP OF GUTTER
107+30.00	17.00′	-0.0200	1927.04	FLOWLINE
107+35.00	17.00′	-0.0200	1926.90	FLOWLINE
107+40.00	17.00′	-0.0176	1926.79	FLOWLINE
107+45.00	17.00′	-0.0146	1926.69	FLOWLINE
107+50.00	15.00′	-0.0116	1926.60	LIP OF GUTTER
107+55.00	15.00′	-0.0086	1926.48	LIP OF GUTTER
107+60.00	15.00′	-0.0056	1926.35	LIP OF GUTTER
107+65.00	15.00′	-0.0026	1926.22	LIP OF GUTTER
107+70.00	15.00′	0.0000	1926.08	LIP OF GUTTER
107+75.00	15.00′	0.0025	1925.94	LIP OF GUTTER
107+80.00	15.00′	0.0050	1925.81	LIP OF GUTTER
107+85.00	15.00′	0.0076	1925.71	LIP OF GUTTER
107+90.00	15.00′	0.0106	1925.63	LIP OF GUTTER
107+95.00	15.00′	0.0136	1925.67	LIP OF GUTTER
108+00.00	15.00′	0.0166	1925.53	LIP OF GUTTER
108+05.00	15.00′	0.0183	1925.49	LIP OF GUTTER
108+10.00	15.00′	0.0200	1925.47	LIP OF GUTTER
108+15.00	15.00′	0.0190	1925.43	LIP OF GUTTER
108+20.00	15.00′	0.0180	1925.41	LIP OF GUTTER
108+30.00	15.00′	0.0150	1925.40	LIP OF GUTTER

LEFT SIDE ELEVATION DATA

STATION	OFFSET	CROSS SLOPE	ELEVATION	DESCRIPTION
103+30.00	12.00′	-0.0200	1949.43	LIP OF GUTTER
103+40.00	12.00′	-0.0200	1948.43	LIP OF GUTTER
103+50.00	12.00′	-0.0200	1947.43	LIP OF GUTTER
103+60.00	12.00	-0.0200	1946.43	LIP OF GUTTER
103+70.00	12.00′	-0.0200	1945.42	LIP OF GUTTER
103+80.00	12.00	-0.0200	1944.42	LIP OF GUTTER
103+90.00	12.00′	-0.0200	1943.42	LIP OF GUTTER
107+30.00	17.00′	-0.0200	1927.04	FLOWLINE
107+35.00	17.00′	-0.0200	1926.90	FLOWLINE
107+40.00	17.00′	-0.0200	1926.75	FLOWLINE
107+45.00	17.00′	-0.0200	1926.59	FLOWLINE
107+50.00	17.00′	-0.0200	1926.43	FLOWLINE
107+55.00	15.00′	-0.0200	1926.31	LIP OF GUTTER
107+60.00	15.00′	-0.0200	1926.13	LIP OF GUTTER
107+65.00	15.00′	-0.0200	1925.96	LIP OF GUTTER
107+70.00	15.00′	-0.0200	1925.78	LIP OF GUTTER
107+75.00	15.00′	-0.0200	1925.60	LIP OF GUTTER
107+80.00	15.52′	-0.0200	1925.43	LIP OF GUTTER
107+85.00	16.06′	-0.0200	1925.27	LIP OF GUTTER
107+90.00	16.60′	-0.0200	1925.14	LIP OF GUTTER
107+95.00	17.13′	-0.0200	1925.03	LIP OF GUTTER
108+00.00	17.67′	-0.0200	1924.93	LIP OF GUTTER
108+05.00	18.21′	-0.0210	1924.84	LIP OF GUTTER
108+10.00	18.74′	-0.0210	1924.77	LIP OF GUTTER
108+15.00	19.28′	-0.0235	1924.68	LIP OF GUTTER
108+20.00	19.82′	-0.0260	1924.62	LIP OF GUTTER
108+25.00	19.72′	-0.0275	1924.61	LIP OF GUTTER
108+30.00	20.85′	-0.0200	1924.57	LIP OF GUTTER

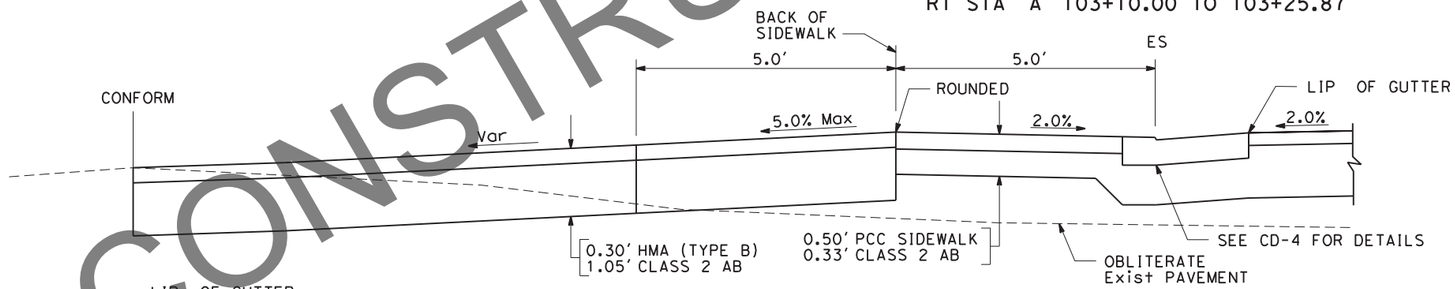


SIDEWALK, CURB & GUTTER TRANSITION TO CONCRETE BARRIER TYPE 80 SWA

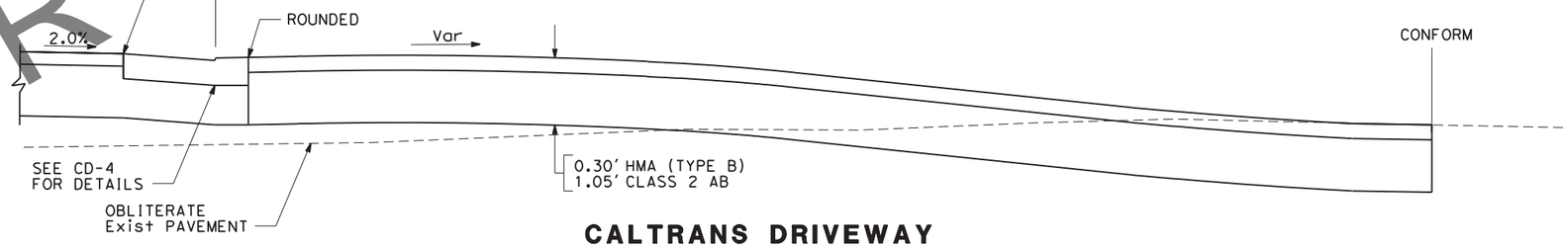


CURB & GUTTER AT BLAIRS LANE/BACO DRIVE

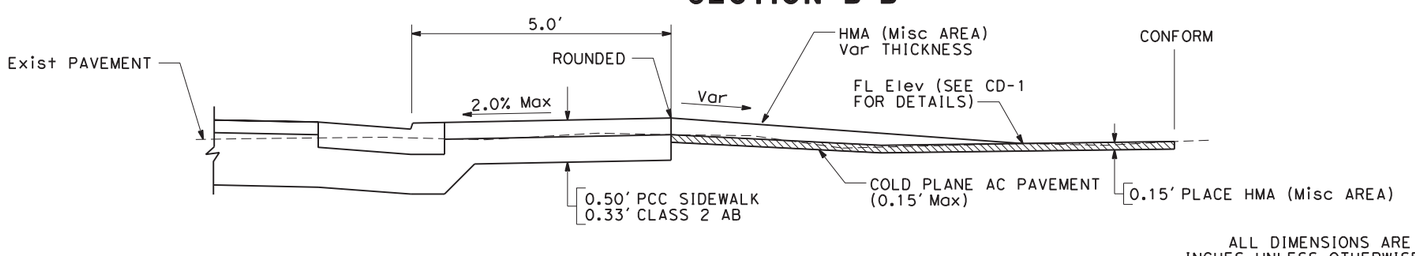
RT STA "A" 103+10.00 TO 103+25.87



PG&E DRIVEWAY SECTION A-A



CALTRANS DRIVEWAY SECTION B-B



COMMERCIAL DRIVEWAY SECTION C-C

ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SHOWN

CONSTRUCTION DETAILS

NO SCALE

CD-3

LAST REVISION 00-00-00 — DATE PLOTTED => 3/11/2015 — TIME PLOTTED => 3:46:10 PM

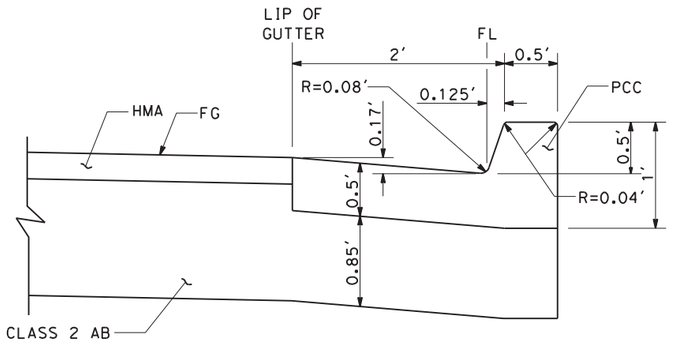
FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

FILE => s:\Client\PLACERVI\p07-300\CAD\pl96r\pl96rcd3.dgn

CU 00000 | EA 000000

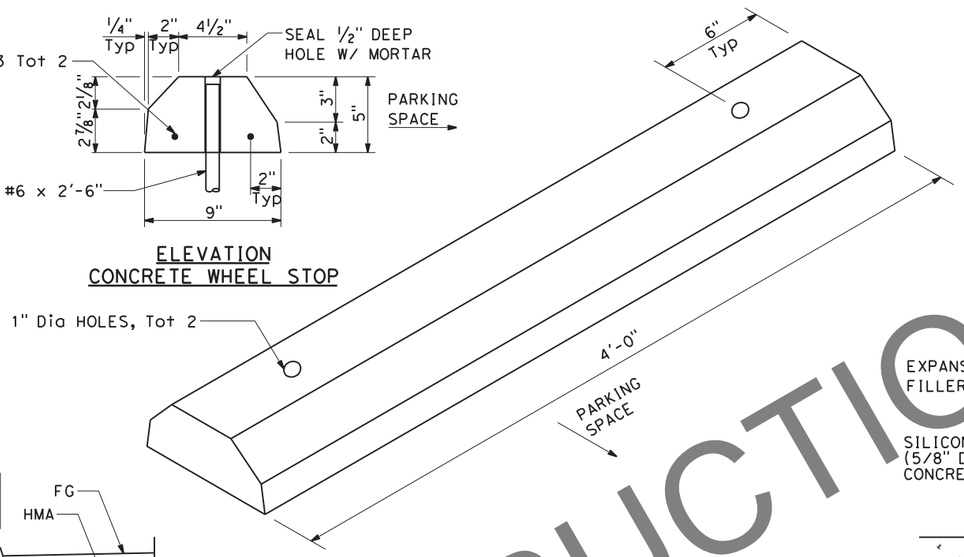
NOTES:

1. ½" TRANSVERSE EXPANSION JOINTS AT 20' INTERVALS FOR CURB & GUTTER.
2. FOR CURB LOCATION, SEE CD-1 AND CD-2.

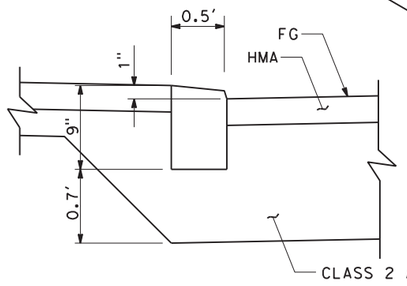


CURB & GUTTER

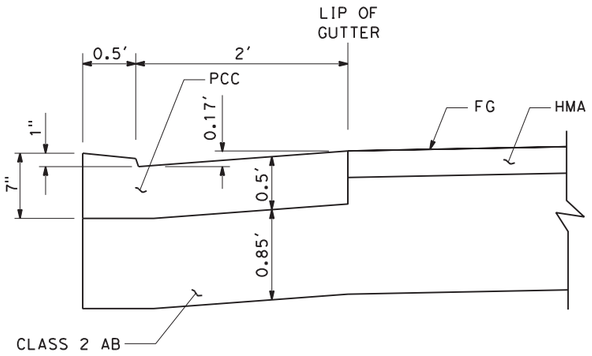
ELEVATION
CONCRETE WHEEL STOP



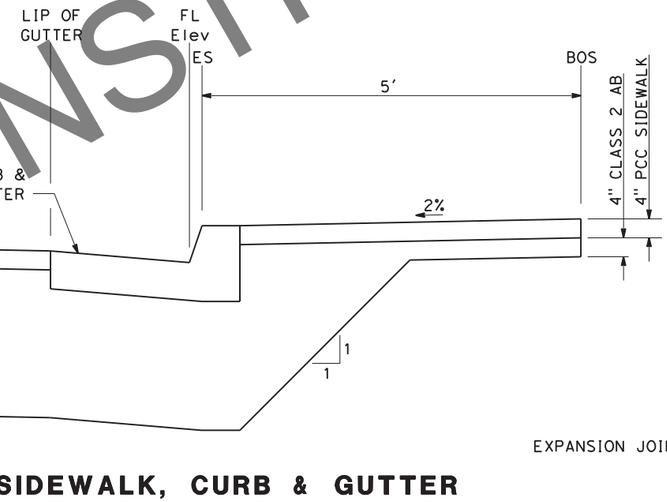
CONCRETE WHEEL STOP



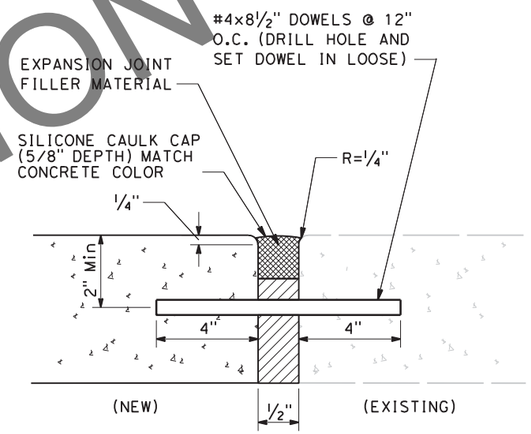
CURB AT CURB RAMP
SEE NOTE 2



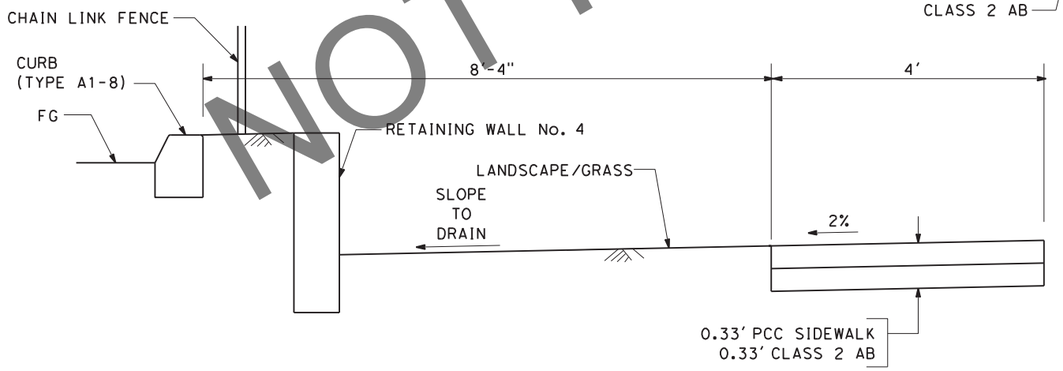
CURB & GUTTER AT DRIVEWAY AND CURB RAMPS
SEE NOTE 2



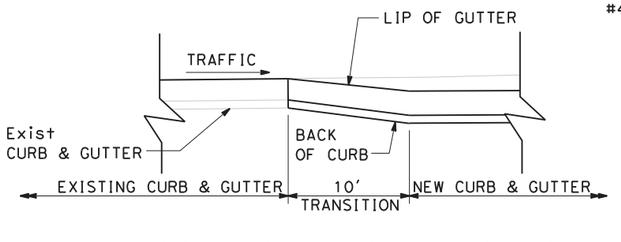
SIDEWALK, CURB & GUTTER



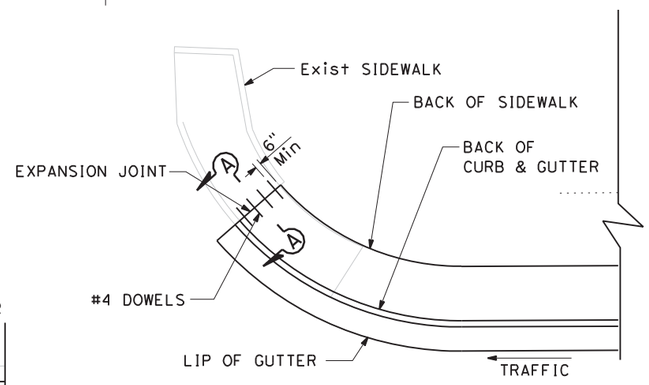
SECTION A-A



DETACHED SIDEWALK DETAIL



CURB & GUTTER TRANSITION



SIDEWALK CONNECTION DETAIL
STA "A" 103+13.49
STA "A" 108+49.47

CONSTRUCTION DETAILS
NO SCALE **CD-4**

NOT FOR CONSTRUCTION

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
03	ED	BLAIRS LN			

100% SUBMITTAL
REGISTERED CIVIL ENGINEER
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — C. Davis — No. C58440 — Exp. 12/31/16 — CIVIL — STATE OF CALIFORNIA

The Identity or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

QUINCY ENGINEERING, INC
11017 Cobblerock Drive
Rancho Cordova, CA 95670

CALCULATED/ DESIGNED BY	DATE	REVISED BY	DATE REVISED
CHECKED BY	VFD 05/07	MRR	4/12
XX	XX/0X	PSK	7/13

PROJECT ENGINEER
CAROLYN DAVIS

AGENCY NAME
CITY OF PLACERVILLE DEPARTMENT OF PUBLIC WORKS

LAST REVISION 00-00-00
DATE PLOTTED => 3/11/2015
TIME PLOTTED => 3:46:39 PM

FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

FILE => s:\Client\PLACERV\p07-300\CAD\pl96r\pl96rcd4.dgn

CU 00000 EA 000000

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
03	ED	BLAIRS LN			

100% SUBMITTAL

REGISTERED CIVIL ENGINEER

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QUINCY ENGINEERING, INC
11017 Cobblerock Drive
Rancho Cordova, CA 95670

CALCULATED/ DESIGNED BY	VFD	DATE	REVISED BY	DATE REVISED
CHECKED BY	XX	05/07	MRR	4/12
		XX/0X	PSK	7/13

PROJECT ENGINEER: CAROLYN DAVIS

AGENCY NAME: CITY OF PLACERVILLE DEPARTMENT OF PUBLIC WORKS

19.26' RT "A" 103+15.26
BEGIN FENCE (TYPE CL-6)
BEGIN REMOVE FENCE

55.21' LT "A" 103+64.71
BEGIN Temp FENCE (TYPE CL-6) (BY OTHERS)

54.85' LT "A" 103+64.75
BEGIN SUBSTATION FENCE
BEGIN REMOVE FENCE
CONNECT TO Exist

35.50' LT "A" 104+53.80

27.51' LT "A" 104+53.80

27.51' LT "A" 103+71.41

47.00' LT "A" 105+86.06
END Temp FENCE (TYPE CL-6) (BY OTHERS)
BEGIN TEMP FENCE (TYPE CL-6)

26.54' LT "A"
BEGIN SUBSTATION FENCE CONNECT TO Exist
BEGIN REMOVE FENCE

49.03' LT "A" 105+26.88

26.66' LT "A" 105+39.52
END SUBSTATION FENCE

35.50' LT "A" 105+26.68

Exist GATE TO REMAIN

R/W

TCE

TSF

22.87' LT "A" 107+06.62
END REMOVE FENCE

35.00' LT "A" 105+86.06

19.25' LT "A" 105+88.26
ANGLE POINT

19.25' LT "A" 106+19.76
ANGLE POINT

35.00' LT "A" 106+32.33

26.50' LT "A" 106+39.28

26.50' LT "A" 106+96.80
BEGIN Temp FENCE ESA

22.24' LT "A" 106+87.81
END SUBSTATION FENCE

60.04' LT "A" 106+96.80
ANGLE POINT

60.04' LT "A" 107+09.96
END Temp FENCE ESA

60.04' LT "A" 107+29.93
BEGIN Temp FENCE ESA

60.04' LT "A" 107+38.79

16.62' LT "A" 107+41.10
END Temp FENCE ESA

TCE

TFESA

23.74' LT "A" 106+87.81
BEGIN SUBSTATION FENCE

103+00 | 104+00 | 105+00 | "A" LINE | 106+00 | 107+00 | 108+00

43.00' RT "A" 103+84.78
ANGLE POINT

15.50' RT "A" 103+25.00
ANGLE POINT

23.37' RT "A" 102+80.39
BEGIN Temp FENCE (TYPE CL-6)

25.11' LT "A" 105+42.42
END REMOVE FENCE

27.58' RT "A" 105+58.17
END Temp FENCE (TYPE CL-6)
END FENCE (TYPE CL-6)
END REMOVE FENCE
BEGIN GATE

43.00' RT "A" 105+48.02
ANGLE POINT

28.74' RT "A" 105+84.73
BEGIN Temp FENCE (TYPE CL-6)
BEGIN REMOVE FENCE

27.58' RT "A" 106+03.81
END GATE
BEGIN FENCE (TYPE CL-6)
BEGIN FENCE (TYPE CL-3)

TCE

"C" LINE 2+50

17.59' LT "C" 2+71.64
END FENCE (TYPE CL-3)

36.00' RT "A" 106+19.50
ANGLE POINT

22.27' RT "A" 106+78.57
END FENCE (TYPE CL-6)

23.75' RT "A" 106+96.94
END REMOVE FENCE

25.00' RT "A" 106+97.62
BEGIN Temp FENCE ESA

36.00' RT "A" 106+92.50
END Temp FENCE (TYPE CL-6)

44.00' RT "A" 106+90.94

UTILITY Ease

R/W

24.25' LT "A" 107+06.71
END SUBSTATION FENCE
END Temp FENCE (TYPE CL-6)

25.00' RT "A" 107+36.95
END Temp FENCE ESA

44.00' RT "A" 107+36.95
ANGLE POINT

44.00' RT "A" 107+13.26
BEGIN Temp FENCE ESA

44.00' RT "A" 106+97.29
END Temp FENCE ESA

NOT FOR CONSTRUCTION

LEGEND

- TEMPORARY FENCE (TYPE CL-6) (PLACED BY OTHERS)
- TEMPORARY FENCE ESA
- TEMPORARY FENCE (TYPE CL-6) (PLACED BY CONTRACTOR)
- TEMPORARY SILT FENCE
- EROSION CONTROL

CONSTRUCTION DETAILS

SCALE: 1'=20'

CD-5

LAST REVISION: 00-00-00
DATE PLOTTED => 3/11/2015
TIME PLOTTED => 3:47:28 PM

FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

FILE => s:\Client\PLACERVI\p07-300\CAD\pl96r\pl96rcd5.dgn

CU 00000 | EA 000000

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
03	ED	BLAIRS LN			

100% SUBMITTAL

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — C. Davis — No. C58440 — Exp. 12/31/16 — CIVIL — STATE OF CALIFORNIA

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QUINCY ENGINEERING, INC
11017 Cobblerock Drive
Rancho Cordova, CA 95670

NOTE:

FOR GATE DETAILS NOT SHOWN, SEE P.G.&E. STANDARD DRAWINGS NUMBER 059661, 059662, 059663, 059664 AND 059665.

GENERAL REQUIREMENTS FOR DESIGN AND CONSTRUCTION:

1. THE STANDARD PROPERTY FENCE SHALL BE 7 FEET HIGH: 3 ROWS OF BARBED WIRE ON EXTENSION ARMS OVER 6 FEET OF FABRIC.
2. EXCEPTIONS:
   (a) WHERE LOCAL ORDINANCES PROHIBIT USE OF BARBED WIRE, FABRIC SHALL BE 7 FEET HIGH.
   (b) WHERE THE FENCE IS CLOSURE THAN 5 FEET TO EXPOSED ENERGIZED EQUIPMENT, THE FENCE SHALL BE 10 FEET HIGH.
   (c) THE FENCE SHALL HAVE 7 FEET OF FABRIC AND 6 ROWS OF BARBED WIRE AT GENERATION STATIONS, SUBSTATIONS, & ALL GAS FACILITIES WHICH HAVE ANY EQUIPMENT HANDLING THE FLOW OF GAS BY OTHER THAN MANUALLY OPERATED VALVE(S).
   (d) FOR FENCING WITH NO BARBED WIRE OR MASONRY WALLS, THE HEIGHT OF FENCE WILL BE 10 FEET TALL.
3. MATERIALS:

   ALL COMPONENTS FOR A GIVEN INSTALLATION SHALL BE FURNISHED BY THE SAME SUPPLIER.

   STEEL PIPE USED FOR POSTS, RAILS, BRACES AND GATE FRAMES SHALL CONFORM TO THE SPECIFICATIONS OF ASTM A120.

   STRUCTURAL AND ROLL FORMED SHAPES SHALL BE ASTM A36, HOT DIPPED GALVANIZED PER ASTM A123 FOR GALVANIZED COATING.

   HARDWARE, EXCEPT TIE WIRE AND BARBED WIRE SHALL COMPLY WITH ASTM A153 FOR GALVANIZED COATING.

   BARBED WIRE SHALL CONFORM TO THE SPECIFICATION OF ASTM A121 CLASS 1. IT SHALL CONSIST OF TWO STRANDS OF 12-1/2 GAGE WIRE, TWISTED WITH 4 POINT, 14 GAGE BARBS SPACED AT 5" O.C.

   EXTENSION ARMS SHALL BE DESIGNED TO CARRY, AND TO ANCHOR SECURELY, THREE ROWS OF BARBED WIRE EQUALLY SPACED, AND IN ADDITION SHALL HAVE ADEQUATE STRENGTH TO SUPPORT A VERTICAL LOAD OF 200 POUNDS AT THE OUTER END.

   CHAIN-LINK FABRIC SHALL BE FABRICATED FROM 9 GAGE WIRE. THE SIZE OF MESH SHALL BE 2 INCH. FABRIC SHALL HAVE TWISTED AND BARBED SELVAGE ON TOP AND KNUCKLED SELVAGE ON THE BOTTOM. FABRIC SHALL BE COATED WITH EITHER ZINC, ALUMINUM OR PLASTIC AS SPECIFIED HEREIN AND IN THE CONTRACT.

   (a) ZINC-COATED STEEL CHAIN-LINK FENCE FABRIC SHALL CONFORM TO ASTM A392 AND SHALL HAVE A CLASS I ZINC COATING.

   (b) ALUMINUM-COATED STEEL CHAIN-LINK FENCE FABRIC SHALL CONFORM TO ASTM A491(2).

   (c) PLASTIC-COATED STEEL CHAIN-LINK FENCE FABRIC SHALL BE THERMALLY EXTRUDED OVER ZINC-COATED STEEL WIRE, OR ALUMINUM-COATED STEEL WIRE, OR THERMALLY BONDED OVER PLASTIC PRIMED STEEL WIRE AT MANUFACTURER'S OPTION. THICKNESS APPLICABLE TO COATINGS ON STEEL WIRE SHALL BE IN ACCORDANCE WITH TABLE III OF FEDERAL SPECIFICATION RR-F-191/1 (GSA-FSS) COLOR SELECTION SHALL BE APPROVED BY P.C.& E. ENGINEERING DEPARTMENT.

   CHAIN-LINK FABRIC WHERE RUSTAKE FENCING IS SPECIFIED SHALL BE FABRICATED FROM 9 GAGE WIRE. THE SIZE OF MESH SHALL BE 3-1/2". THE SELVAGE TOP AND BOTTOM SHALL BE KNUCKLED. ZINC COATING SHALL CONFORM TO ASTM A392 CLASS I. REDWOOD PICKETS SHALL BE GRADE "A" REDWOOD 3/8" X 2-3/8" STAINED. RUSTAKE FENCING SHOULD NOT BE USED WITHOUT COORDINATION WITH THE SECURITY DEPARTMENT.
4. TEMPORARY CHAIN-LINK FENCE:

   THE NOTES ABOVE AND LISTED REFERENCE DRAWINGS APPLY TO PERMANENT FENDING. FOR TEMPORARY FENCING USE DRIVEN STEEL TEE SECTION, STEEL PIPE OR CHANNEL SECTION FENCE POSTS, AND CHAIN-LINK FABRIC. USE EXTENSION ARMS AND BARBED WIRE WHERE TEMPORARY FENCING ALSO PROVIDES SITE SECURITY.

REFERENCES:

GROUNDING	DWG. NO. 020607
INSULATION DISTRICTS	DWG. NO. 026300
FENCE ELEVATIONS AND NOTES	DWG. NO. 059660
GATE ELEVATIONS AND NOTES	DWG. NO. 059661
FENCE DETAILS	DWG. NO. 059662
SQUARE TUBE ORNAMENTAL PROPERTY GATE	DWG. NO. 059663
LOCK ASSEMBLY FABRICATION DRAWING	DWG. NO. 059664
CENTER GATE STOP FABRICATION DRAWING	DWG. NO. 059665

APPROVED BY	REV.	DATE	DESCRIPTION	DWN.	CHKD.	APVD.
	4	5/20/10	REVISED GENERAL REQUIREMENTS #2 (c) & ADDED #2 (d)	EH	DLC	MV
	3	2-4-87	REVISED NOTE 2.0	RP	RCL	
	2	6-21-82	CHANGED BARBED WIRE REQUIREMENT NO. 2(c)	M.L.	RH	
	1	7-27-80	SUPERSEDES DRAWING 047000, SHEET NO 2	EAS		

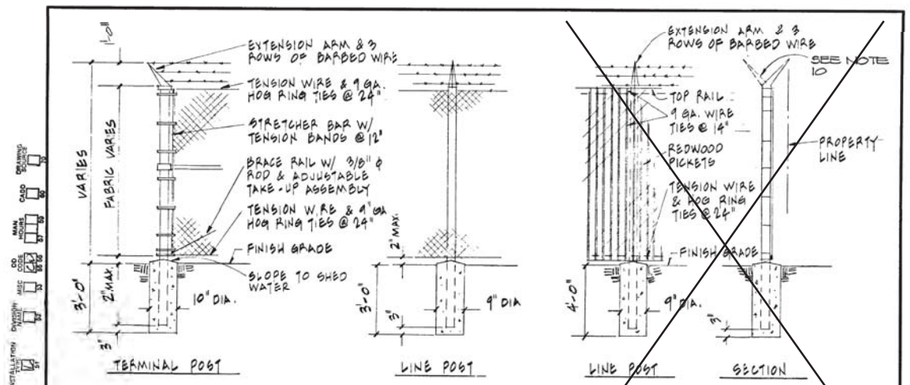
GM 5365	
SUPV. K. TABER	
DSGN. P. TEAMES	
DWN. B. SMITH	
CHKD.	
O.K.	
DATE 2-26-80	SCALE NONE

ENGINEERING STANDARD

PROPERTY FENCE AND GATES

DEPARTMENT OF ENGINEERING
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

SUPERSEDES 047000
SUPERSEDED BY
SHEET NO. OF SHEETS
DRAWING NUMBER 059659
REV. 4
MICROFILM



CHAIN LINK FABRIC FENCE

CHAIN LINK FABRIC FENCE WITH REDWOOD PICKETS

TABLE 1 FENCE POSTS AND BRACES FOR
(a) GALVANIZED CHAIN LINK FABRIC
(b) ALUMINUM COATED CHAIN LINK FABRIC
(c) PLASTIC COATED. GALVANIZED CHAIN LINK FABRIC

FABRIC HEIGHT	FENCE FRAMING	POSTS LINE	POSTS TERMINAL	BRACES
6'-0" ~~7'-0"~~ & ~~8'-0"~~	STANDARD WEIGHT PIPE	2-3/8" O.D. 3.65#/FT.	2-7/8" O.D. 5.79#/FT.	1-5/8" O.D. 2.27#/FT.
	ROLL FORM SECTION	1-7/8" X 1-5/8" 2.28#/FT.	3-1/2" X 3-1/2" 4.85#/FT.	1-5/8" X 1-1/4" 1.35#/FT.
	ALUMINUM SHAPES	2-1/2" O.D. SCHED. 40	2-1/2" SQ. 2.9#/FT.	2" O.D. SCHED. 40

~~TABLE 2 FENCE POSTS AND RAILS FOR (d) GALVANIZED CHAIN LINK FABRIC WITH REDWOOD PICKETS~~

FABRIC HEIGHT	FENCE FRAMING	POSTS LINE	POSTS TERMINAL	RAILS & BRACES
6'-0" 7'-0" & 8'-0"	STANDARD WEIGHT PIPE	2-7/8" O.D. 5.79#/FT.	2-7/8" O.D. 5.79#/FT.	1-5/8" O.D. 2.27#/FT.
	ROLL FORM SECTION	2-1/4" X 1-5/8" 2.64#/FT.	3-1/2" X 3-1/2" 4.85#/FT.	1-5/8" X 1-1/4" 1.35#/FT.
	ALUMINUM SHAPES	2-1/2" SQ. 2.9 #/FT.	2-1/2" SQ. 2.9#/FT.	2" O.D. SCHED. 40

NOTES:

1. SEE DWG. #059659 FOR STD. FENCE REQUIREMENTS.
2. POST SPACING SHALL NOT EXCEED 10' CENTERS. ~~FOR 7'-0" FABRIC FENCE W/REDWOOD PICKETS USE 8' CENTERS FOR POST SPACING.~~
3. CONCRETE FOR FOOTINGS SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 2500 PSI AT 28 DAYS.
4. CHAIN LINK FABRIC SHALL BE STRETCHED AND SECURELY FASTENED TO THE POSTS. FABRIC SHALL BE FASTENED TO RAILS AND TOP & BOTTOM TENSION WIRE WITH TIE WIRES, HOG RINGS OR METAL BANDS.
5. TENSION WIRES, 7 GA. COIL SPRING, GALV., SHALL BE STRETCHED TIGHT.
6. THE FABRIC SHALL BE FASTENED TO END, CORNER & GATE POSTS WITH 1/4" X 3/4" STRETCHER BARS AND NOT LESS THAN 1/8" X 3/4" STRETCH BAR BANDS UNLESS 3-1/2" X 3-1/2" ROLL FORMED TERMINALS WITH INTEGRAL LOCK LOOPS FOR ATTACHING FABRIC ARE USED.
7. BARBED WIRE SHALL BE INSTALLED ON EXTENSION ARMS. EACH WIRE SHALL BE PULLED TAUT. WIRE SHALL BE ATTACHED TO END, CORNER & GATE POSTS WITH WIRE STRETCHING BANDS.
8. CHANGES IN LINE WHERE THE ANGLE OF DEFLECTION EXCEED 30 DEGREES SHALL BE CONSIDERED AS CORNERS AND CORNER POSTS SHALL BE INSTALLED.
9. EXPOSED TOP SURFACE OF CONCRETE POST FOOTINGS SHALL BE STEEL TROWELED TO A SLOPE TO PROVIDE A NEAT APPEARANCE AND TO SHED WATER.
10. PROVIDE V-TYPE BARBED WIRE EXTENSION ARMS AND 6 ROWS OF BARBED WIRE WHEN REQUIRED BY SECURITY DEPT. AND AT ALL ENERGIZED STATIONS.
11. EXCEPT FOR RUSTAKE FENCES TOP RAILS SHALL NOT BE INCLUDED ON PROPERTY FENCES.

APPROVED BY	REV.	DATE	DESCRIPTION	DWN.	CHKD.	APVD.
	2	6/19/80	ADDED ALUMINUM SHAPES & REVISED NOTE 10	EAS	RH	
	1	7-27-80	SUPERSEDES DRAWING 047000 SHEET 2	EAS		

GM 5365	
SUPV. K. TABER	
DSGN. P. TEAMES	
DWN. B. SMITH	
CHKD.	
O.K.	
DATE 2-26-80	SCALE NONE

ENGINEERING STANDARD

FENCE ELEVATIONS AND NOTES
PROPERTY FENCE AND GATES

DEPARTMENT OF ENGINEERING
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

SUPERSEDES 047000
SUPERSEDED BY
SHEET NO. OF SHEETS
DRAWING NUMBER 059660
REV. 2
MICROFILM

SUBSTATION FENCE DETAILS

CONSTRUCTION DETAILS

NO SCALE

CD-6

PROJECT ENGINEER: CAROLYN DAVIS

AGENCY NAME: CITY OF PLACERVILLE DEPARTMENT OF PUBLIC WORKS

CALCULATED/DESIGNED BY | CHECKED BY

DATE	VFD	MRR	PSK
05/07	XX	4/12	7/13
REVISED BY	XX/OX	DATE REVISED	

CAD USER: EXH3 DATE: 05-20-10
VECTOR: 059659 .EDS
RASTER:

LAST REVISION 00-00-00 DATE PLOTTED => 3/11/2015 TIME PLOTTED => 3:50:20 PM

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FILE => S:\Client\PLACERVI\p07-300\CAD\pl96r\Roadway Plans_V8 Files\pl96rcd6.dgn

CU 00000 EA 000000

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
03	ED	BLAIRS LN			

100% SUBMITTAL

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

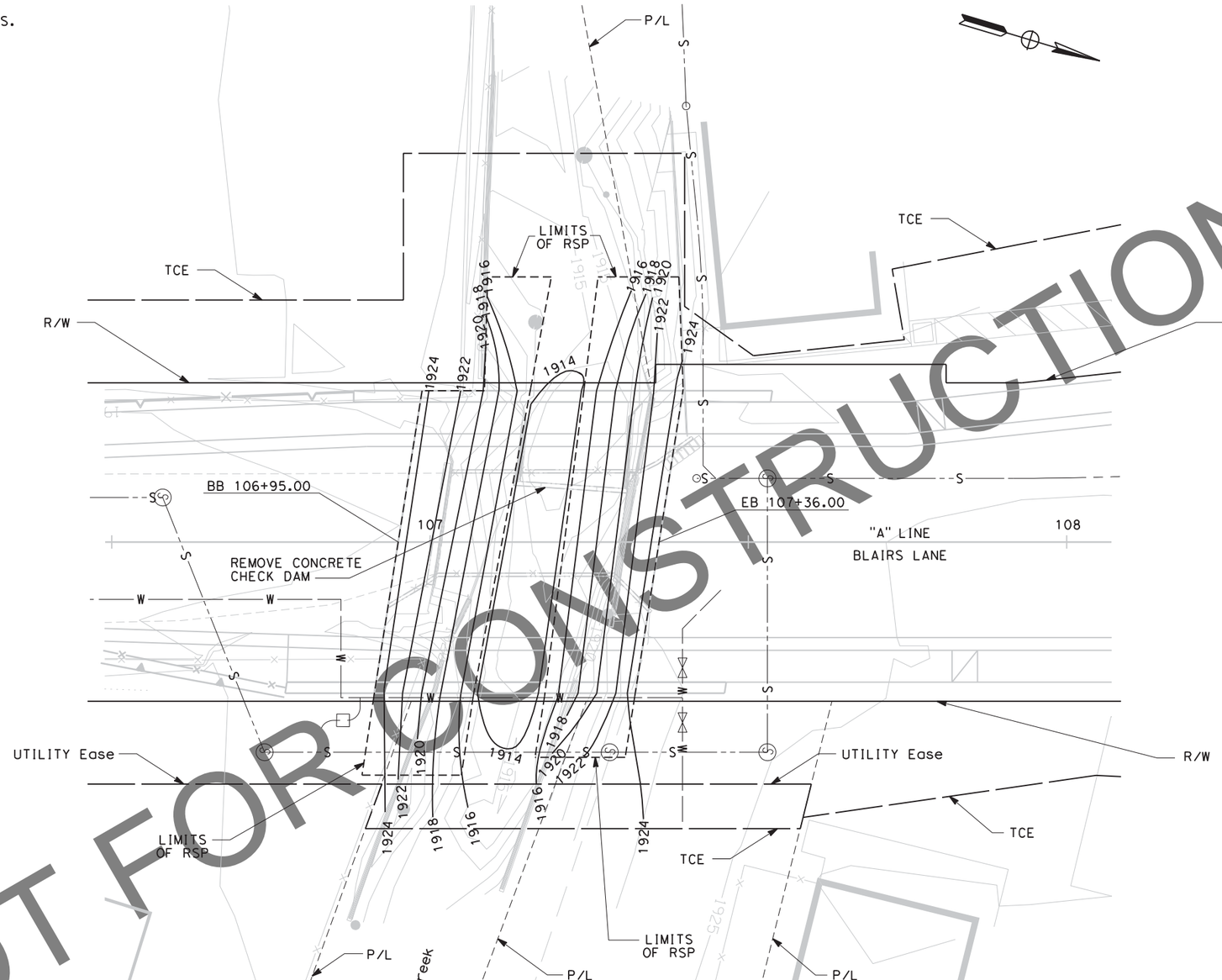
REGISTERED PROFESSIONAL ENGINEER — C. Davis — No. C58440 — Exp. 12/31/16 — CIVIL — STATE OF CALIFORNIA

The Identity or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

QUINCY ENGINEERING, INC
11017 Cobblerock Drive
Rancho Cordova, CA 95670

NOTES:

1. FOR RSP DETAILS, SEE DRAINAGE DETAILS.



NOT FOR CONSTRUCTION

THIS PLAN IS ACCURATE FOR CONTOUR GRADING ONLY

CONTOUR GRADING

1" = 10'

CG-1

CALCULATED/ DESIGNED BY	VFD	DATE	REVISED BY	MRR	PSK
CHECKED BY	XX	XX/XX	DATE REVISED	4/12	7/13

PROJECT ENGINEER: CAROLYN DAVIS

AGENCY NAME: CITY OF PLACERVILLE DEPARTMENT OF PUBLIC WORKS

LAST REVISION 00-00-00 | DATE PLOTTED => 3/11/2015 | TIME PLOTTED => 3:47:55 PM

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CU 00000

EA 000000

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
03	ED	BLAIRS LN			

100% SUBMITTAL

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — C. Davis — No. C58440 — Exp. 12/31/16 — CIVIL — STATE OF CALIFORNIA

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QUINCY ENGINEERING, INC
11017 Cobblerock Drive
Rancho Cordova, CA 95670

NOT FOR CONSTRUCTION

EROSION CONTROL

SHEET No.	FROM		TO		TEMPORARY FENCE (TYPE ESA)	TEMPORARY FENCE (TYPE CL-6)	TEMPORARY CONCRETE WASHOUT	TEMPORARY CONSTRUCTION ENTRANCE	EROSION CONTROL (DRY SEED)	TEMPORARY DRAINAGE INLET PROTECTION	COMMENTS
	LINE	STATION	LINE	STATION	LF	LF	EA	EA	SQFT	EA	
CD-5	"A"	106+96.80	"A"	107+09.96	46.7						
CD-5	"A"	107+29.93	"A"	107+41.10	52.5						
CD-5	"A"	106+97.62	"A"	106+97.29	26.5						
CD-5	"A"	107+13.26	"A"	107+36.95	42.7						
CD-5	"A"	105+86.06	"A"	107+06.71		137.0					TEMP CL-6 FENCE (PLACED BY CONTRACTOR)
L-1	"A"	103+10.00	"A"	108+59.05			2	2		15	
CD-5	"A"	103+64.75	"A"	105+39.52					1751.0		
CD-5	"A"	103+15.26	"C"	2+71.50					862.5		
CD-5	"A"	105+74.54	"A"	106+32.02					861.7		
CD-5	"C"	2+71.77	"A"	106+78.34					418.7		
CD-5	"A"	103+15.26	"A"	105+58.17		288.8					TEMP CL-6 FENCE (PLACED BY CONTRACTOR)
CD-5	"A"	105+84.73	"A"	106+97.62		108.5					TEMP CL-6 FENCE (PLACED BY CONTRACTOR)
				TOTAL	168.4	534.3	2	2	3893.9	15	

EROSION CONTROL QUANTITIES

ECQ-1

CALCULATED/ DESIGNED BY	VFD	DATE 05/07	REVISED BY	MRR	PSK
CHECKED BY	XX	XX/0X	DATE REVISED	4/12	7/13

PROJECT ENGINEER: CAROLYN DAVIS

AGENCY NAME: CITY OF PLACERVILLE DEPARTMENT OF PUBLIC WORKS

LAST REVISION: 00-00-00 | DATE PLOTTED => 3/11/2015 | TIME PLOTTED => 3:51:29 PM

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CU 00000 | EA 000000

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
03	ED	BLAIRS LN			

100% SUBMITTAL

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — C. Davis — No. C58440 — Exp. 12/31/16 — CIVIL — STATE OF CALIFORNIA

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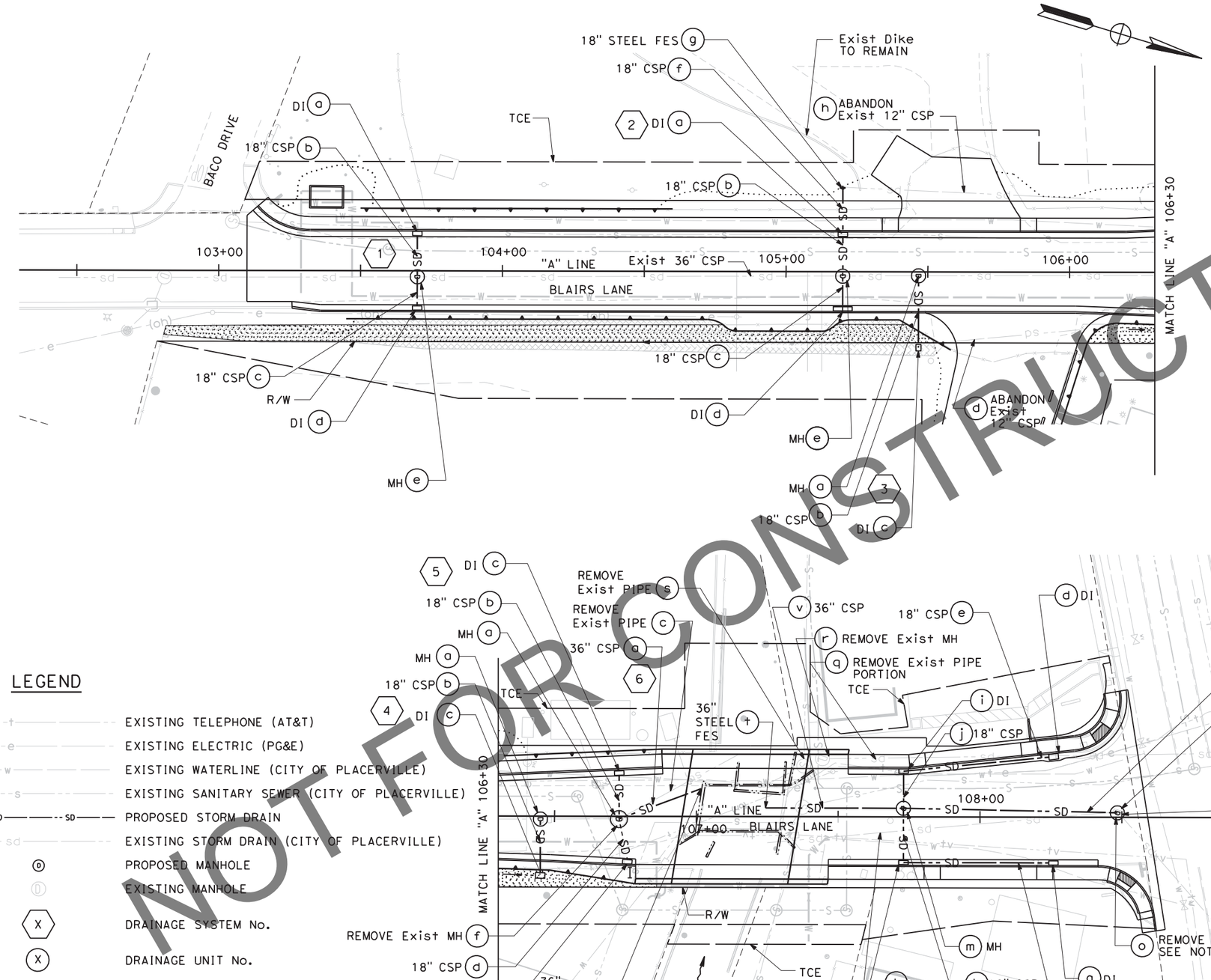
11017 Cobblerock Drive
Rancho Cordova, CA 95670



NOTES:

1. THIS PLAN ACCURATE FOR DRAINAGE WORK ONLY.
2. THE LOCATION OF THE EXISTING MANHOLE LOCATED AT THE NORTH END OF BLAIRS LANE IS TO BE DETERMINED BY THE CONTRACTOR. SYSTEM 7 IS TO CONNECT TO THE EXISTING STORM DRAIN THAT CROSSES BROADWAY IN THIS VICINITY.
3. FOR PROPOSED SEWER AND WATERLINE WORK, SEE SEWER AND WATER PLANS. FOR ALL OTHER UTILITIES, SEE UTILITY PLANS.

NOT FOR CONSTRUCTION

LEGEND

- EXISTING TELEPHONE (AT&T)
- EXISTING ELECTRIC (PG&E)
- EXISTING WATERLINE (CITY OF PLACERVILLE)
- EXISTING SANITARY SEWER (CITY OF PLACERVILLE)
- PROPOSED STORM DRAIN
- EXISTING STORM DRAIN (CITY OF PLACERVILLE)
- PROPOSED MANHOLE
- EXISTING MANHOLE
- (X) DRAINAGE SYSTEM No.
- (X) DRAINAGE UNIT No.

DRAINAGE PLAN

1" = 20'

D-1

CALCULATED/ DESIGNED BY	CHECKED BY	VFD	DATE	REVISED BY	DATE REVISED
	PSK			MRR	4/12 7/13
		XX	05/07	XX/0X	

PROJECT ENGINEER: CAROLYN DAVIS

AGENCY NAME: CITY OF PLACERVILLE DEPARTMENT OF PUBLIC WORKS

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CU 00000

EA 000000

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
03	ED	BLAIRS LN			

100% SUBMITTAL

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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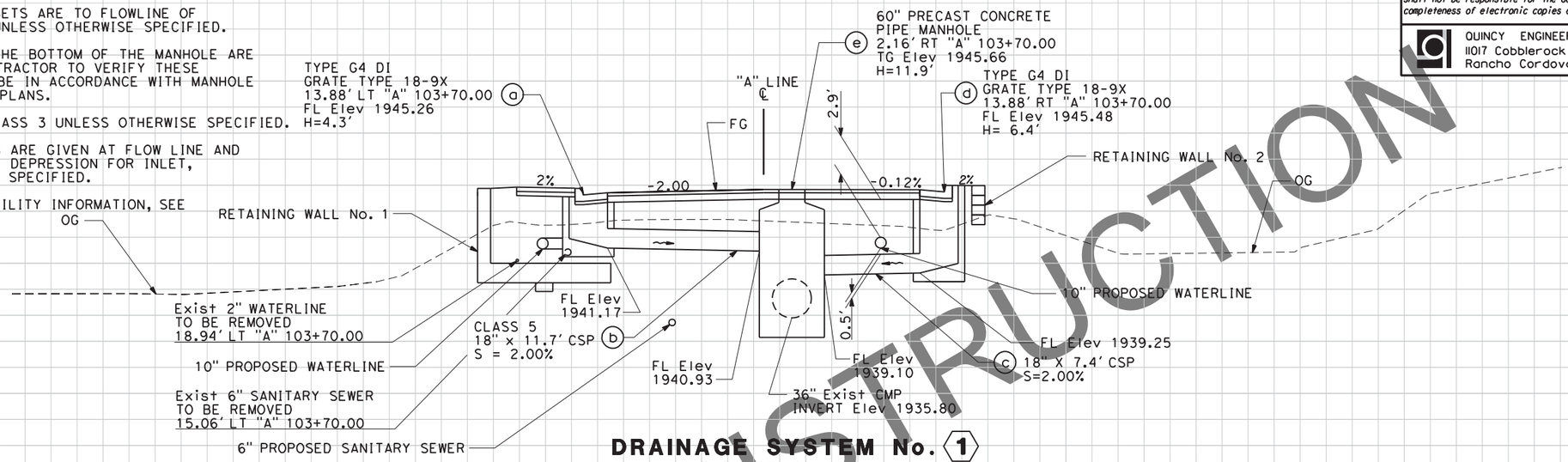
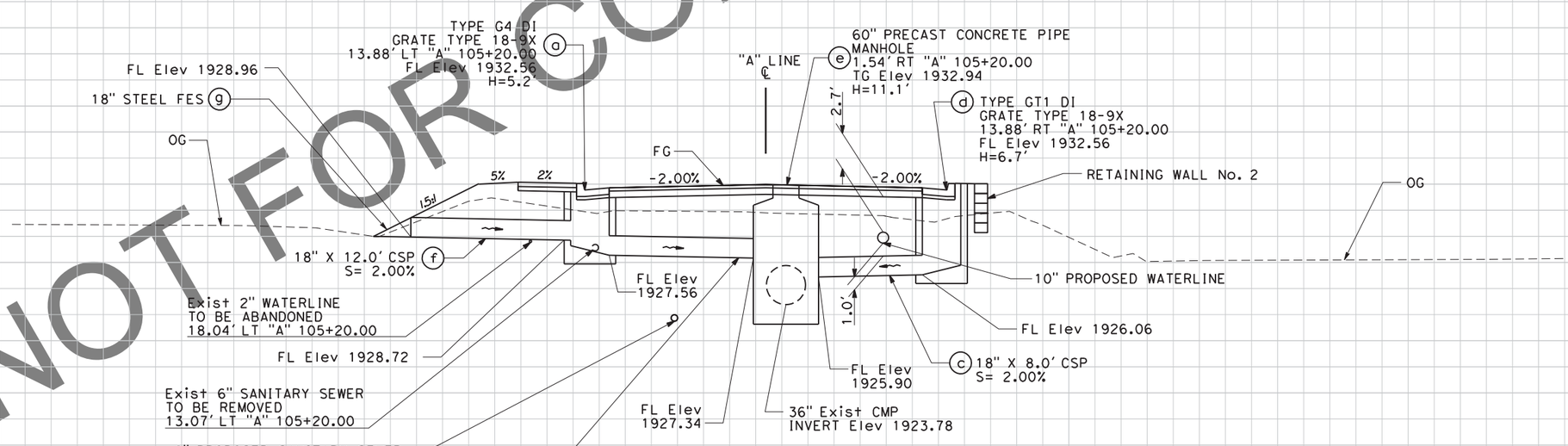
11017 Cobblerock Drive
Rancho Cordova, CA 95670

NOTES:

1. THIS PLAN ACCURATE FOR DRAINAGE WORK ONLY.
2. THE CONTRACTOR SHALL VERIFY ALL CONTROLLING FIELD DIMENSIONS BEFORE ORDERING OR FABRICATING ANY MATERIAL.
3. FOR ADDITIONAL SEWER AND WATER INFORMATION, SEE SEWER AND WATER PLANS.
4. ALL STATION OFFSETS ARE TO FLOWLINE OF DRAINAGE INLET, UNLESS OTHERWISE SPECIFIED.
5. ELEVATIONS FOR THE BOTTOM OF THE MANHOLE ARE APPROXIMATE. CONTRACTOR TO VERIFY THESE ELEVATIONS WILL BE IN ACCORDANCE WITH MANHOLE DETAIL OF THESE PLANS.
6. ALL PIPES ARE CLASS 3 UNLESS OTHERWISE SPECIFIED.
7. GRATE ELEVATIONS ARE GIVEN AT FLOW LINE AND DO NOT REPRESENT DEPRESSION FOR INLET, UNLESS OTHERWISE SPECIFIED.
8. FOR ADDTIONAL UTILITY INFORMATION, SEE UTILITY SHEETS.



DRAINAGE SYSTEM No. (1)
"A" 103+70.00



DRAINAGE SYSTEM No. (2)
"A" 105+20.00

DRAINAGE PROFILE

1"= 5'

DP-1

NOT FOR CONSTRUCTION

DATE	REVISED BY	DATE REVISED
05/07	XX/OX	XX
	MRR	4/12
	PSK	7/13

CALCULATED/DESIGNED BY
CHECKED BY
VFD

PROJECT ENGINEER: CAROLYN DAVIS

AGENCY NAME: CITY OF PLACERVILLE DEPARTMENT OF PUBLIC WORKS

Station	CY Exc	CY Emb

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EA 000000

LAST REVISION

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TIME PLOTTED => 3:52:11 PM

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
03	ED	BLAIRS LN			

100% SUBMITTAL

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — C. Davis — No. C58440 — Exp. 12/31/16 — CIVIL — STATE OF CALIFORNIA

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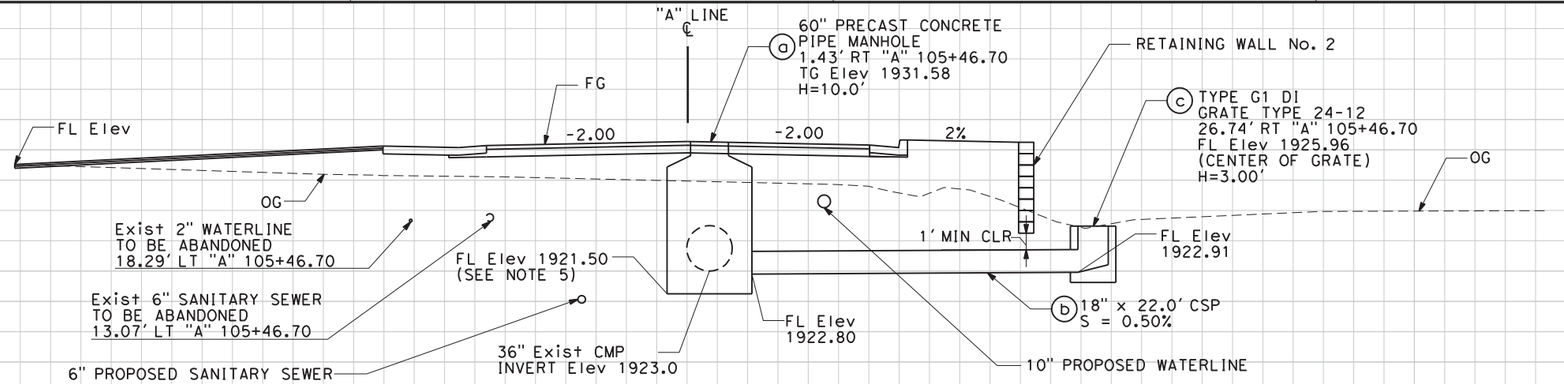
QUINCY ENGINEERING, INC
11017 Cobblerock Drive
Rancho Cordova, CA 95670

DATE	BY	REVISED	BY	DATE REVISED
05/07	VFD	XX	MRR	4/12
	CALCULATED/ DESIGNED BY	CHECKED BY	PSK	7/13

PROJECT ENGINEER: CAROLYN DAVIS

AGENCY NAME: CITY OF PLACERVILLE DEPARTMENT OF PUBLIC WORKS



DRAINAGE SYSTEM No. 3
"A" 105+46.70

NOTES:

1. THIS PLAN ACCURATE FOR DRAINAGE WORK ONLY.
2. THE CONTRACTOR SHALL VERIFY ALL CONTROLLING FIELD DIMENSIONS BEFORE ORDERING OR FABRICATING ANY MATERIAL.
3. FOR ADDITIONAL SEWER AND WATER INFORMATION, SEE SEWER AND WATER PLANS.
4. ALL STATION OFFSETS ARE TO FLOWLINE OF DRAINAGE INLET, UNLESS OTHERWISE SPECIFIED.
5. ELEVATIONS FOR THE BOTTOM OF THE MANHOLE ARE APPROXIMATE. CONTRACTOR TO VERIFY THESE ELEVATIONS WILL BE IN ACCORDANCE WITH MANHOLE DETAIL OF THESE PLANS.
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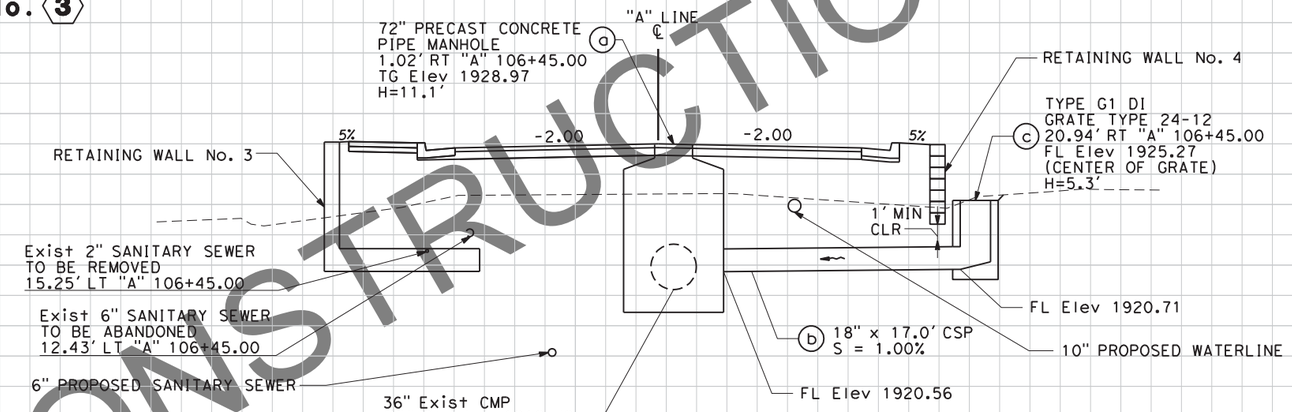
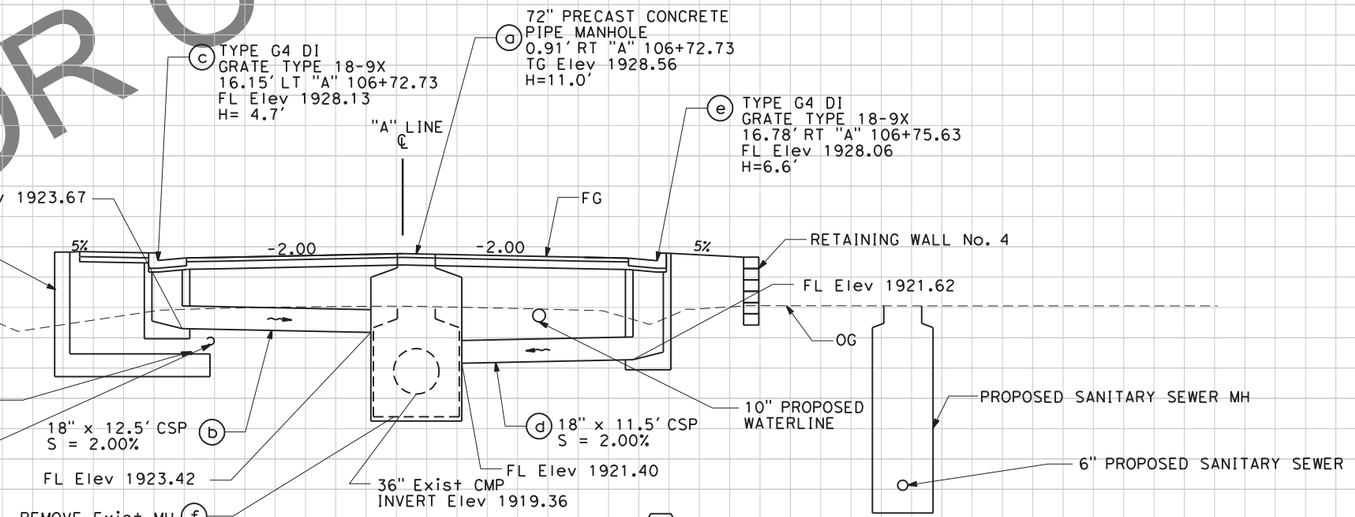
7. GRATE ELEVATIONS ARE GIVEN AT FLOW LINE AND DO NOT REPRESENT DEPRESSION FOR INLET, UNLESS OTHERWISE SPECIFIED.
8. FOR ADDITIONAL UTILITY INFORMATION, SEE UTILITY SHEETS.



DRAINAGE SYSTEM No. 4
"A" 106+45.00



DRAINAGE SYSTEM No. 5
"A" 106+72.73

DRAINAGE PROFILE
1" = 5'

DP-2

NOT FOR CONSTRUCTION

Station		
CY	Exc	
	Emb	

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LAST REVISION => 00-000-000

DATE PLOTTED => 3/11/2015

TIME PLOTTED => 3:53:32 PM

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
03	ED	BLAIRS LN			

100% SUBMITTAL

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — C. Davis — No. 68480 — Exp. 12/31/16 — CIVIL — STATE OF CALIFORNIA

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QUINCY ENGINEERING, INC
11017 Cobblerock Drive
Rancho Cordova, CA 95670

NOTES:

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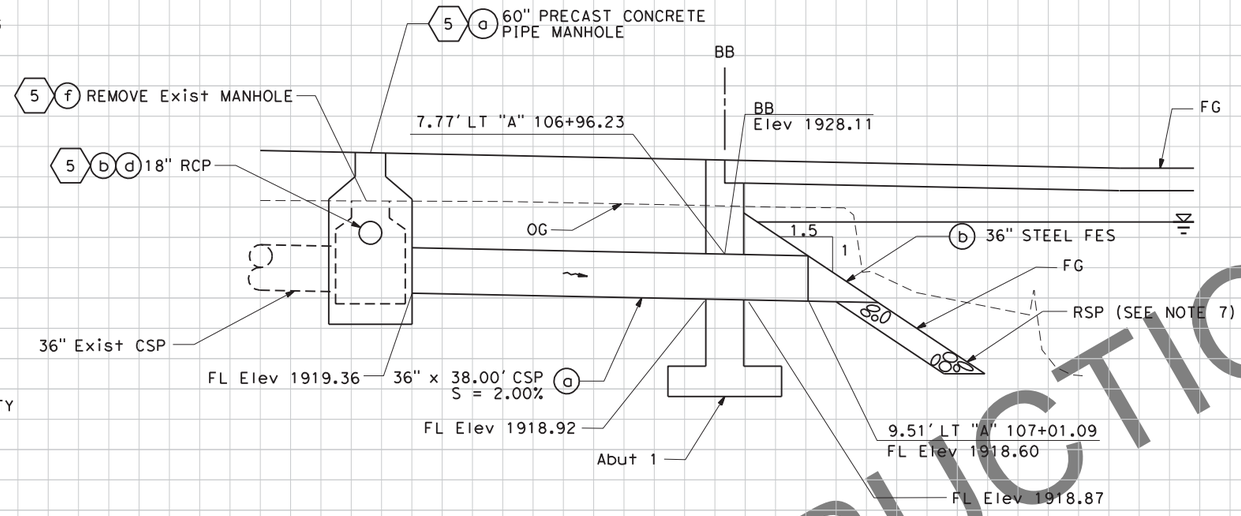
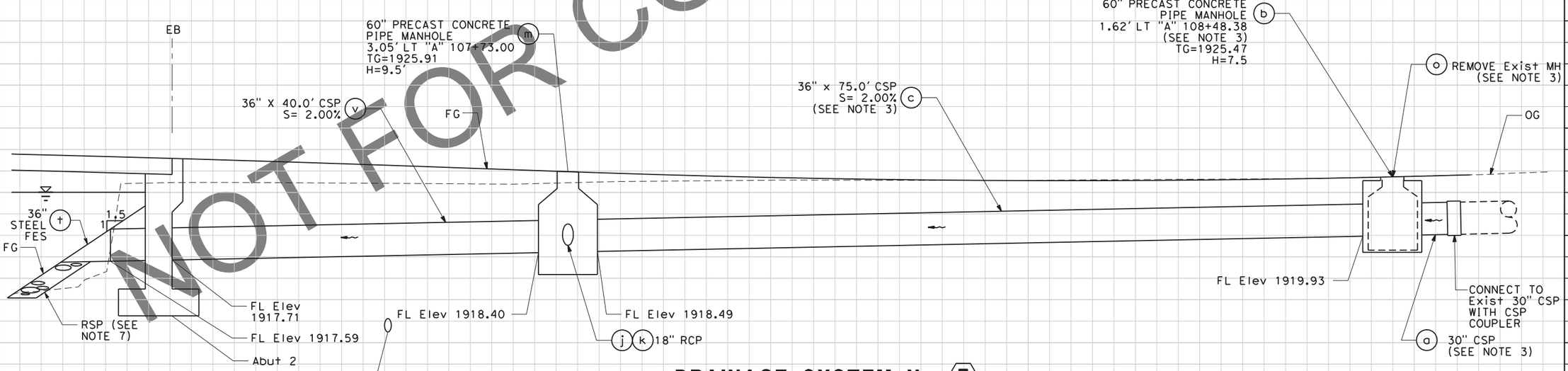
5. ALL PIPES ARE CLASS 3 UNLESS OTHERWISE SPECIFIED.
6. GRATE ELEVATIONS ARE GIVEN AT FLOW LINE AND DO NOT REPRESENT DEPRESSION FOR INLET, UNLESS OTHERWISE SPECIFIED.
7. FOR RSP DETAILS, SEE DRAINAGE DETAILS.
8. FOR ADDITIONAL SEWER AND WATER INFORMATION, SEE SEWER AND WATER PLANS.
9. FOR ADDITONAL UTILITY INFORMATION, SEE UTILITY SHEETS.



DRAINAGE SYSTEM No. 6



DRAINAGE SYSTEM No. 7

DRAINAGE PROFILE

1"= 5'

DP-3

NOT FOR CONSTRUCTION

PROJECT ENGINEER: CAROLYN DAVIS

AGENCY NAME: CITY OF PLACERVILLE DEPARTMENT OF PUBLIC WORKS

CALCULATED/ DESIGNED BY	VFD	DATE	REVISED BY	DATE REVISED
CHECKED BY	XX	05/07	XX/OX	
			MRR	4/12
			PSK	7/13

Station

CY: Exc / Emb

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CU 00000

EA 000000

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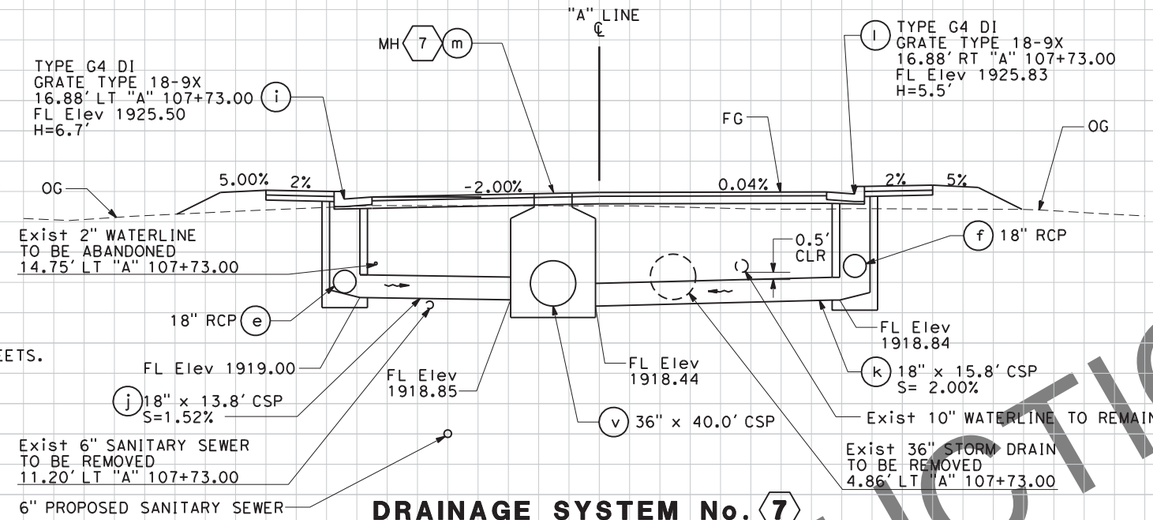
TIME PLOTTED => 3:54:04 PM

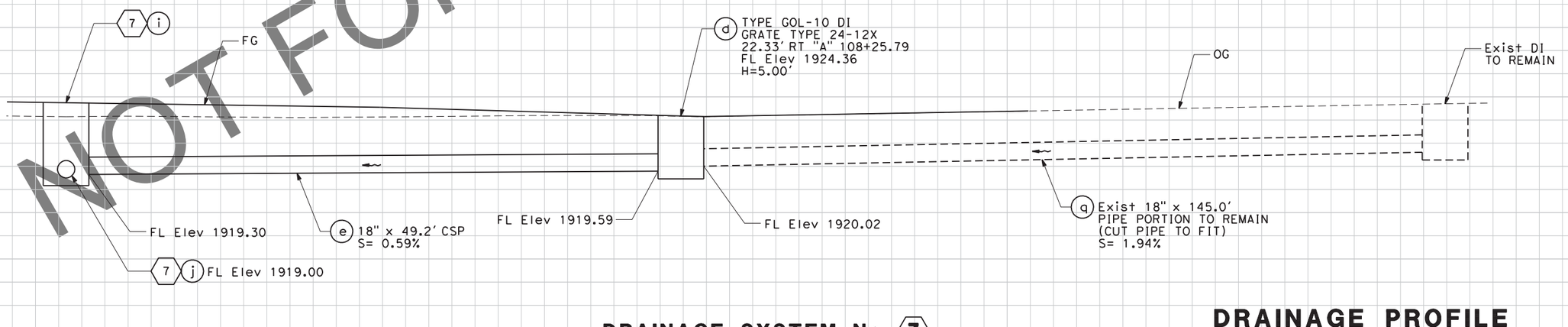
NOTES:

1. THIS PLAN ACCURATE FOR DRAINAGE WORK ONLY.
2. THE CONTRACTOR SHALL VERIFY ALL CONTROLLING FIELD DIMENSIONS BEFORE ORDERING OR FABRICATING ANY MATERIAL.
3. ALL STATION OFFSETS ARE TO FLOWLINE OF DRAINAGE INLET, UNLESS OTHERWISE SPECIFIED.
4. ALL PIPES ARE CLASS 3 UNLESS OTHERWISE SPECIFIED.
5. GRATE ELEVATIONS ARE GIVEN AT FLOW LINE AND DO NOT REPRESENT DEPRESSION FOR INLET, UNLESS OTHERWISE SPECIFIED.
6. FOR GOL DI DETAILS, SEE DRAINAGE DETAILS SHEETS.
7. FOR ADDITIONAL SEWER AND WATER INFORMATION, SEE SEWER AND WATER PLANS.
8. FOR ADDITIONAL UTILITY INFORMATION SEE UTILITY SHEETS.



DRAINAGE SYSTEM No. 7
"A" 107+73.00

DRAINAGE SYSTEM No. 7
"A" 107+73.00 TO 108+25.90



DRAINAGE SYSTEM No. 7
"A" 107+73.00 TO 108+27.95

DRAINAGE PROFILE

1" = 5'

DP-4

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
03	ED	BLAIRS LN			

100% SUBMITTAL
REGISTERED CIVIL ENGINEER
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — C. Davis — No. 688480 — Exp. 12/31/16 — CIVIL — STATE OF CALIFORNIA

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QUINCY ENGINEERING, INC
11017 Cobblerock Drive
Rancho Cordova, CA 95670

DATE	REVISED BY	DATE REVISED
05/07	MRR	4/12/13
	PSK	

CALCULATED/DESIGNED BY
VFD
DATE
CHECKED BY
XX
XX/XX

PROJECT ENGINEER
CAROLYN DAVIS

AGENCY NAME
CITY OF PLACERVILLE DEPARTMENT OF PUBLIC WORKS

Station		
CY	Exc	
	Emb	

NOT FOR CONSTRUCTION

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CU 00000

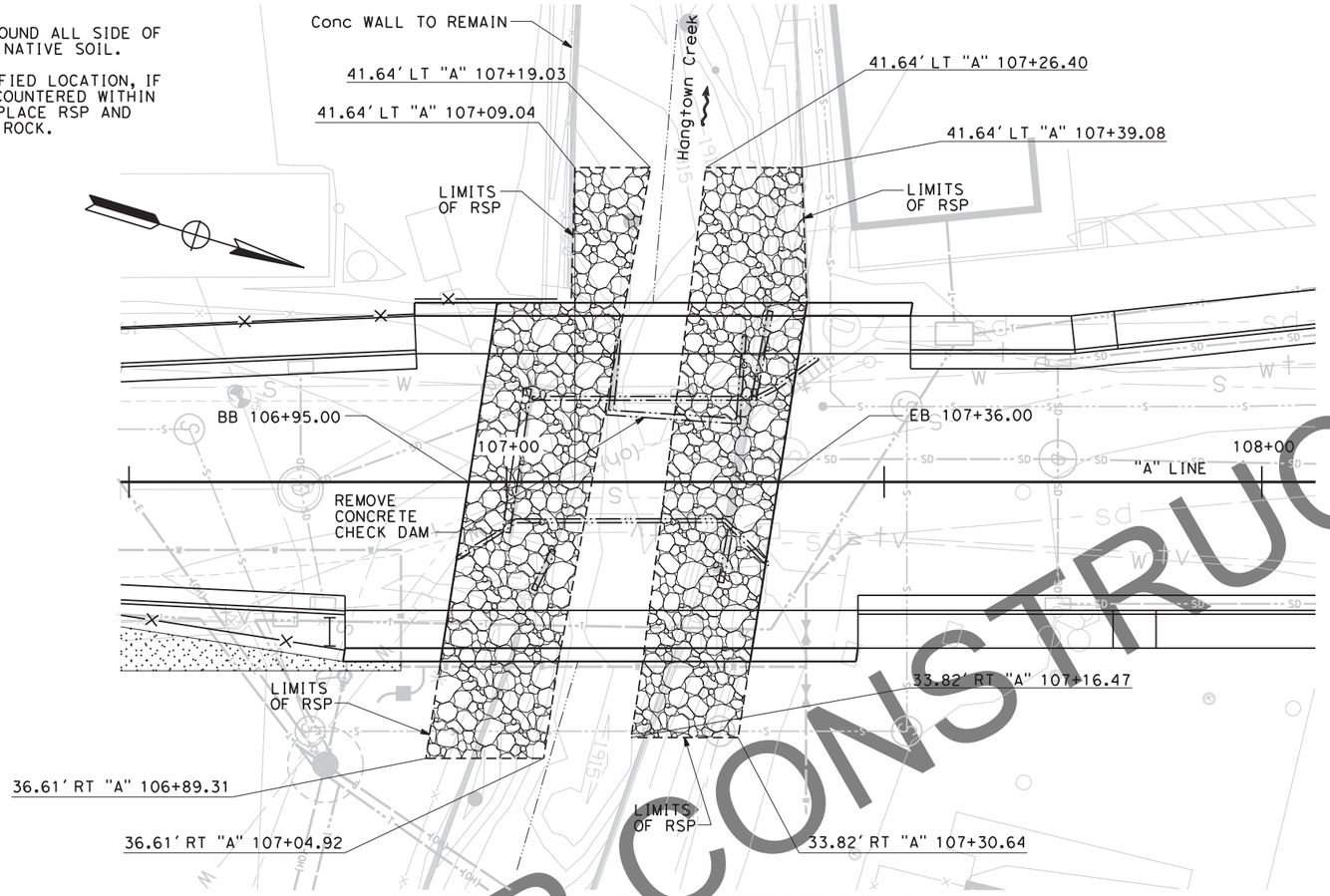
EA 000000

LAST REVISION

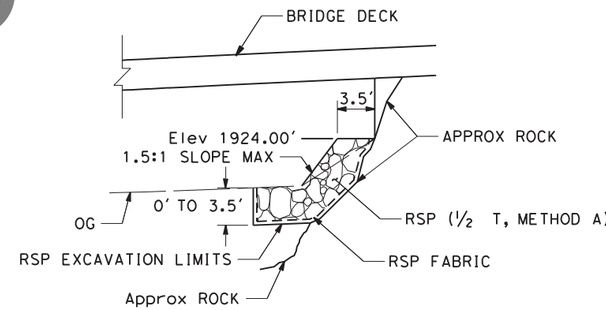
DATE PLOTTED => 3/11/2015
TIME PLOTTED => 3:55:26 PM

NOTES:

1. WRAP RSP FABRIC AROUND ALL SIDE OF RSP INTERFACE WITH NATIVE SOIL.
2. PLACE RSP AT SPECIFIED LOCATION, IF ROCK IF ROCK IS ENCOUNTERED WITHIN EXCAVATION LIMITS, PLACE RSP AND FABRIC DIRECTLY ON ROCK.

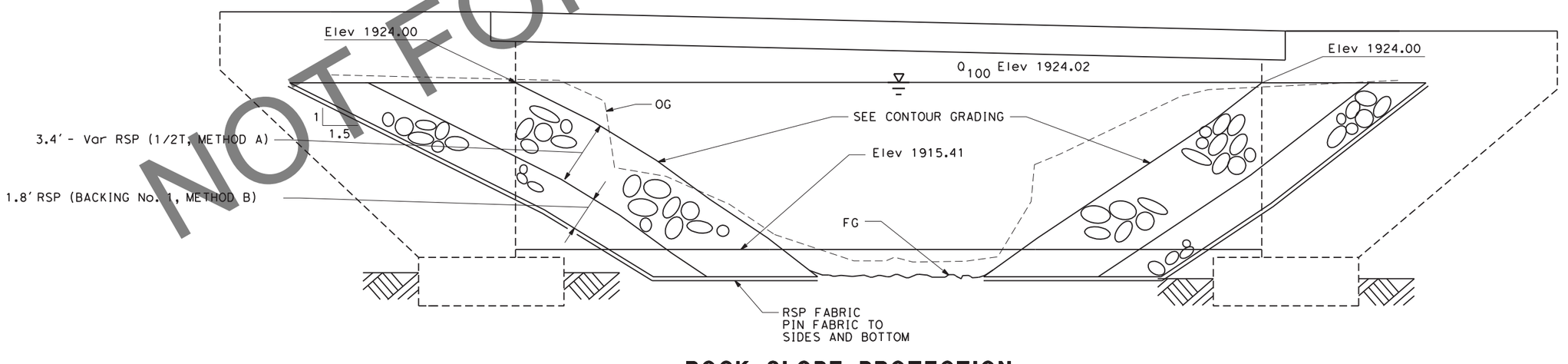


ROCK SLOPE PROTECTION PLAN



ROCK SLOPE PROTECTION ON EXPOSED ROCK

SEE NOTE 2



ROCK SLOPE PROTECTION TYPICAL SECTION

NOT FOR CONSTRUCTION

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
03	ED	BLAIRS LN			

100% SUBMITTAL

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — C. Davis — No. C58440 — Exp. 12/31/16 — CIVIL — STATE OF CALIFORNIA

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QUINCY ENGINEERING, INC
11017 Cobblerock Drive
Rancho Cordova, CA 95670

CALCULATED/ DESIGNED BY	VFD	DATE	REVISED BY	DATE REVISED
CHECKED BY	XX	05/07	MRR	4/12
		XX/0X	PSK	7/13

PROJECT ENGINEER: CAROLYN DAVIS

AGENCY NAME: CITY OF PLACERVILLE DEPARTMENT OF PUBLIC WORKS

DRAINAGE DETAILS

NO SCALE

DD-1

LAST REVISION 00-00-00 — DATE PLOTTED => 3/11/2015 — TIME PLOTTED => 3:48:52 PM

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CU 00000

EA 000000

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
03	ED	BLAIRS LN			

100% SUBMITTAL

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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QUINCY ENGINEERING, INC
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Rancho Cordova, CA 95670

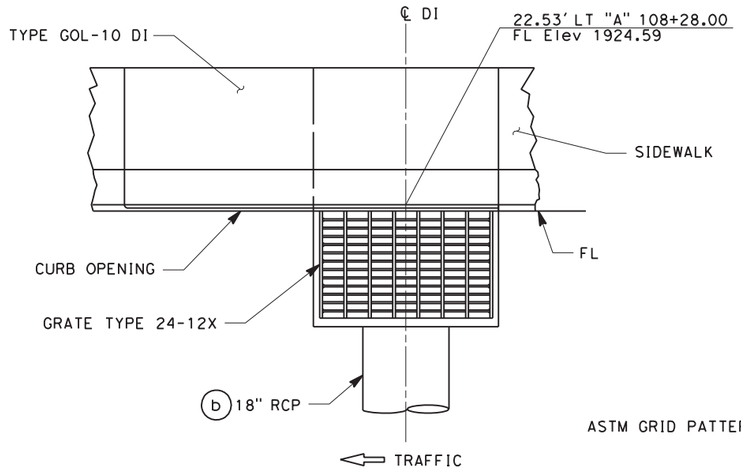
CALCULATED/ DESIGNED BY	DATE	REVISED BY	DATE REVISED
CHECKED BY	VFD 05/07	MRR	4/12
XX	XX/XX	PSK	7/13

PROJECT ENGINEER: CAROLYN DAVIS

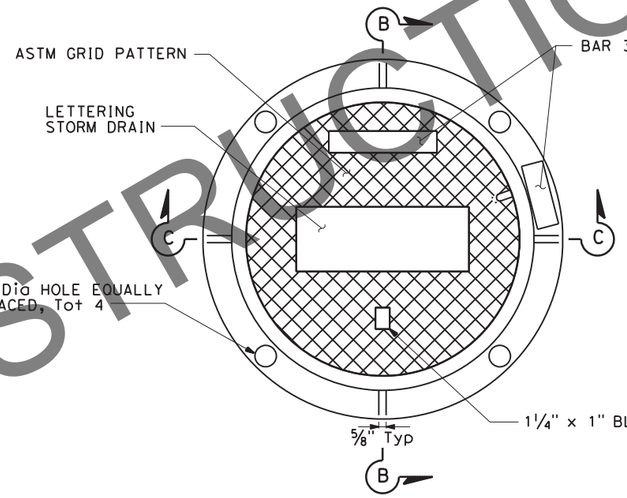
AGENCY NAME: CITY OF PLACERVILLE DEPARTMENT OF PUBLIC WORKS

NOTES:

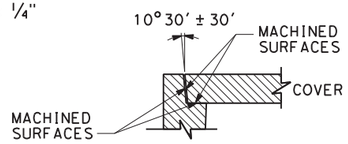
1. ON ALL PIPE UP TO 30" ID USE FLEXIBLE COMPRESSION GASKET OR BOOT CONNECTOR CONFORMING TO ASTM C-923. CONNECTION SHALL BE WATER AND SOIL TIGHT. FOR PIPES GREATER THAN 30" ID, BASE MAY BE CAST-IN-PLACE AND A WATER STOP CONFORMING TO ASTM C-923 SHALL BE USED.
2. SUMP SHALL BE 12" DEEP, MEASURED FROM INVERT OF OUTFALL PIPE. SUMP NOT REQUIRED IF OUTFALL PIPE IS 24" ID OR LARGER.
3. RISER SECTIONS, CONES, AND ADJUSTING RINGS SHALL CONFORM TO ASTM C-478.
4. ALL JOINTS SHALL BE MADE WITH PREFORMED PLASTIC JOINT SEALING COMPOUND. FOLLOWING INSTALLATION GROUT ALL INTERIOR AND EXTERIOR JOINTS.
5. CONCENTRIC COMPONENTS SHALL BE USED UNLESS OTHERWISE SPECIFIED ON THE PLANS.
6. PRE-CAST MANHOLES SHALL BE SIZED TO PROVIDE THE FOLLOWING: THE ANNULAR SPACE ON THE INSIDE OF THE MANHOLE BARREL BETWEEN CORED PIPE CONNECTION HOLES SHALL BE A MINIMUM OF 10". IF THE CONNECTION HOLE IS CAST MONOLITHICALLY WITH THE MANHOLE BARREL THE MEASUREMENT SHALL BE TAKEN FROM THE FINISHED CONCRETE CONNECTION SURFACE.
7. GRATE ELEVATIONS ARE GIVEN AT FLOWLINE AND DO NOT REPRESENT DEPRESSION FOR INLET.
8. FOR ADDITIONAL DRAINAGE INFORMATION, SEE LAYOUT AND DRAINAGE PROFILES SHEETS.
9. STATIONS AND OFFSETS GIVEN ON DRAINAGE PROFILES ARE TO THE CENTER OF THE MANHOLE.



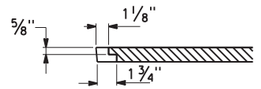
PLAN
GOL DRAINAGE INLET 7 d
SEE NOTES 7 & 8



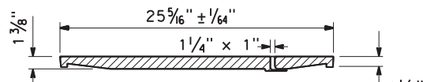
PLAN



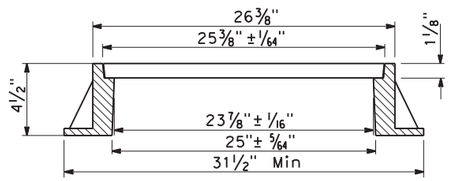
FRAME



SECTION THROUGH CENTER OF PICK HOLE



SECTION B-B
COVER



SECTION C-C
FRAME

NOTES:

1. ALL CASTINGS TO CONFORM TO ASTM A48, CLASS 35B
2. FRAME AND COVER TO MEET H-20 LOAD SPECIFICATIONS.
3. MACHINED HORIZONTAL AND VERTICAL BEARING SURFACES NOT TO EXCEED 0.5 mm TOLERANCE
4. FRAME AND COVER SHALL HAVE A COATING OF BLACK BITUMINOUS MATERIAL.
5. LOCKING COVER TYPE FRAME AND COVERS SHALL BE USED IN EASEMENT AREAS UNLESS OTHERWISE APPROVED.

SET WEIGHT	
FRAME	139 lb
COVER	130 lb
TOTAL	269 lb

MANHOLE FRAME & COVER

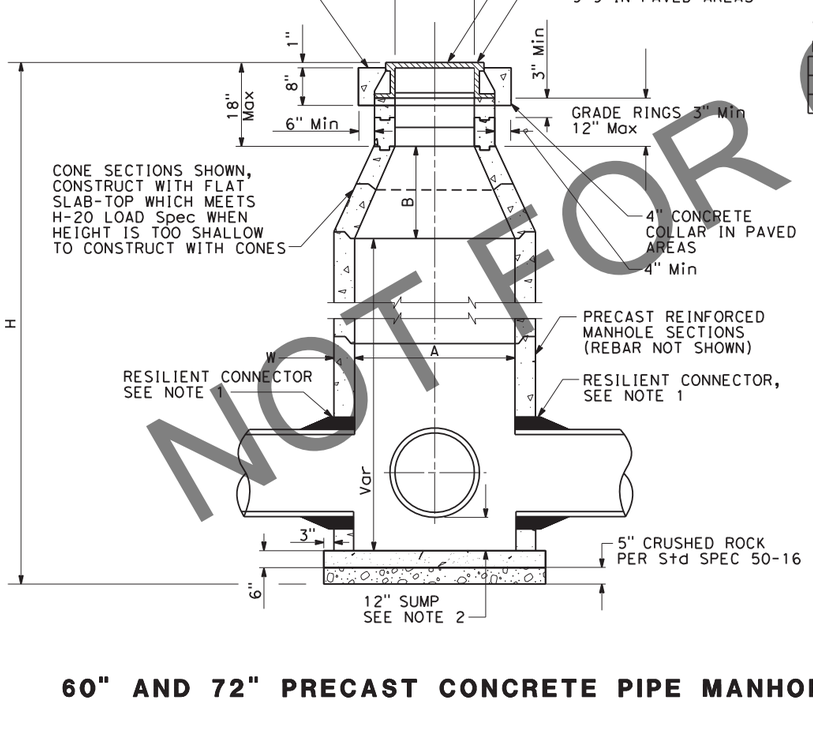


TABLE OF MINIMUM DIMENSIONS (INCHES)			
MH	A	B	W
60	60	36	7
72	72	36	7

60" AND 72" PRECAST CONCRETE PIPE MANHOLE

NOT FOR CONSTRUCTION

ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SHOWN

DRAINAGE DETAILS

NO SCALE **DD-2**

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CU 00000 EA 000000

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
03	ED	BLAIRS LN			

100% SUBMITTAL

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — C. Davis — No. C58440 — Exp. 12/31/16 — CIVIL — STATE OF CALIFORNIA

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QUINCY ENGINEERING, INC
11017 Cobblerock Drive
Rancho Cordova, CA 95670

CALCULATED/ DESIGNED BY				
CHECKED BY	VFD	DATE 05/07	REVISED BY	MRR
	XX	XX/0X	DATE REVISED	4/12
				PSK
				7/13

PROJECT ENGINEER
CAROLYN DAVIS

AGENCY NAME
CITY OF PLACERVILLE DEPARTMENT OF PUBLIC WORKS

DRAINAGE ITEMS

DRAINAGE PLAN SHEET	DRAINAGE SYSTEM	DRAINAGE UNIT No.	STATION	OFFSET	MINOR CONCRETE (MINOR STRUCTURE)	HEIGHT OF INLET "H" (N)	CLASS 2 AGGREGATE BASE*	36" CORRUGATED STEEL PIPE (.109" THICK)	30" CORRUGATED STEEL PIPE (.109" THICK)	18" CORRUGATED STEEL PIPE (.109" THICK)	18" STEEL FLARED END SECTION	36" STEEL FLARED END SECTION	60" PRECAST CONCRETE PIPE	72" PRECAST CONCRETE PIPE	ROCK SLOPE PROTECTION (1/2 T, METHOD A) (CY)	ROCK SLOPE PROTECTION (NO. 1, METHOD B) (CY)	ROCK SLOPE PROTECTION FABRIC (CLASS 8)	MISCELLANEOUS IRON AND STEEL	REMOVE PIPE	REMOVE MANHOLE	ABANDON CULVERT	DESCRIPTION
					CY	LF	CY	LF	LF	LF	EA	EA	LF	LF	CY	CY	SQYD	LB	LF	EA	LF	
D-1	1	a	"A" 103+70.00	13.88' LT	1.6	4.3												187				G4 DI GRATE TYPE 18-9X
		b								11.7												
		c								8.0												
		d	"A" 103+70.00	13.88' RT	2.2	6.4												187				G4 DI GRATE TYPE 18-9X
		e	"A" 103+70.00	2.16' RT			0.4						11.9									
D-1	2	a	"A" 105+20.00	13.88' LT	1.9	5.2												187				G4 DI GRATE TYPE 18-9X
		b								11.1												
		c								8.0												
		d	"A" 105+20.00	13.88' RT	3.0	6.7												374				GT1 DI GRATE TYPE 18-9X
		e	"A" 105+20.00	1.54' RT			0.4						11.1									
		f								12.0												
		g									1.0											
		h																			91.5	ABANDON EXIST 12" CSP
D-1	3	a	"A" 105+46.70	1.43' RT			0.4						10.0									
		b								22.0												
		c	"A" 105+46.70	26.74' RT	1.0	3.0												326				G1 DI GRATE TYPE 24-12
		d																			51.0	ABANDON EXIST 12" CSP
D-1	4	a	"A" 106+45.00	1.02' RT			0.5							11.1								
		b								17.0												
		c	"A" 106+45.00	20.94' RT	1.5	5.3												326				G1 DI GRATE TYPE 24-12
D-1	5	a	"A" 106+72.73	0.91' RT			0.5							11.0								
		b								12.5												
		c	"A" 106+72.73	16.15' LT	1.7	4.7												187				G4 DI GRATE TYPE 18-9X
		d								11.5												
		e	"A" 106+75.63	16.78' RT	2.2	6.6												187				G4 DI GRATE TYPE 18-9X
		f																		1		REMOVE 60" MANHOLE
D-1	6	a						38.0														
		b										1										
		c																	45.1			REMOVE EXIST 36" CSP
D-1	7	a							20.0													UNKNOWN MH LOCATION
		b	"A" 108+48.38	1.62' LT			0.4						7.5									
SUBTOTAL					15.0	42.2	2.5	38.0	20.0	113.8	1	1	40.5	22.1	0.0	0.0	0.0	1,961	45.1	1	142.5	

* FOR TOTAL QUANTITY, SEE "ROADWAY ITEMS" QUANTITY TABLE.
(N) NOT A SEPARATE PAY ITEM, FOR INFORMATION ONLY.

NOT FOR CONSTRUCTION

DRAINAGE QUANTITIES

DQ-1

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Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
03	ED	BLAIRS LN			

100% SUBMITTAL

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — C. Davis — No. C58440 — Exp. 12/31/16 — CIVIL — STATE OF CALIFORNIA

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QUINCY ENGINEERING, INC
11017 Cobblerock Drive
Rancho Cordova, CA 95670

	CALCULATED/ DESIGNED BY	VFD	DATE 05/07	REVISED BY	MRR	PSK
	CHECKED BY	XX	XX/0X	DATE REVISED	4/12	7/13

PROJECT ENGINEER
CAROLYN DAVIS

AGENCY NAME
CITY OF PLACERVILLE DEPARTMENT OF PUBLIC WORKS

DRAINAGE ITEMS

DRAINAGE PLAN SHEET	DRAINAGE SYSTEM	DRAINAGE UNIT No.	STATION	OFFSET	MINOR CONCRETE (MINOR STRUCTURE) CY	HEIGHT OF INLET "H" (N) LF	CLASS 2 AGGREGATE BASE* CY	36" CORRUGATED STEEL PIPE (.109" THICK) LF	30" CORRUGATED STEEL PIPE (.109" THICK) LF	18" CORRUGATED STEEL PIPE (.109" THICK) LF	18" STEEL FLARED END SECTION EA	36" STEEL FLARED END SECTION EA	60" PRECAST CONCRETE PIPE MANHOLE LF	72" PRECAST CONCRETE PIPE MANHOLE LF	ROCK SLOPE PROTECTION (1/2 T, METHOD A) (CY) CY	ROCK SLOPE PROTECTION (NO. 1, METHOD B) (CY) CY	ROCK SLOPE PROTECTION FABRIC (CLASS 8) SQYD	MISCELLANEOUS IRON AND STEEL LB	REMOVE PIPE LF	REMOVE MANHOLE EA	ABANDON CULVERT LF	DESCRIPTION
D-1	7	c						75.0														
		d	"A" 108+25.79	22.55' RT	3.5	5.0												239				GOL-10 DI GRATE TYPE 24-12X
		e								49.2												
		f								49.0												
		g	"A" 108+29.90	16.88' RT	1.6	4.0												187				G4 DI GRATE TYPE 18-9X
		i	"A" 107+73.00	16.88' LT	2.2	6.7												187				G4 DI GRATE TYPE 18-9X
		j								13.8												
		k								15.8												
		l	"A" 107+73.00	16.88' RT	1.9	5.5												187				G4 DI GRATE TYPE 18-9X
		m	"A" 107+73.00	3.05' LT			0.4						9.5									
		n																	124.0			REMOVE EXIST 36" CSP- UNKNOWN MH LOCATION
		o																		1		UNKNOWN MH LOCATION
		q																	81.0			EXIST 18" x 145.0' TO REMAIN
		r																		1		
		s																	6.0			REMOVE EXIST 18" CSP
		t										1										
		v						40.0														
DD-1															311.2	130.2	467.2					
SUBTOTAL FROM SHEET DQ-2					9.2	21.2	0.4	115.0	0.0	127.8	0	1	9.5	0.0	311.2	130.2	467.2	800	211.0	2	0.0	
SUBTOTAL FROM SHEET DQ-1					15.0	42.2	2.5	38.0	20.0	113.8	1	1	40.5	22.1	0.0	0.0	0.0	1,961	45.1	1	142.5	
TOTAL					24.2	63.4	2.9	153.0	20.0	241.6	1	2	50.0	22.1	311.2	130.2	467.2	2,761	256.1	3	142.5	

*FOR TOTAL QUANTITY, SEE "ROADWAY ITEMS" QUANTITY TABLE.
(N) NOT A SEPARATE PAY ITEM, FOR INFORMATION ONLY.

NOT FOR CONSTRUCTION

DRAINAGE QUANTITIES

DQ-2

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TIME PLOTTED => 3:52:03 PM

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
03	ED	BLAIRS LN			

100% SUBMITTAL

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — C. Davis — No. C58440 — Exp. 12/31/16 — CIVIL — STATE OF CALIFORNIA

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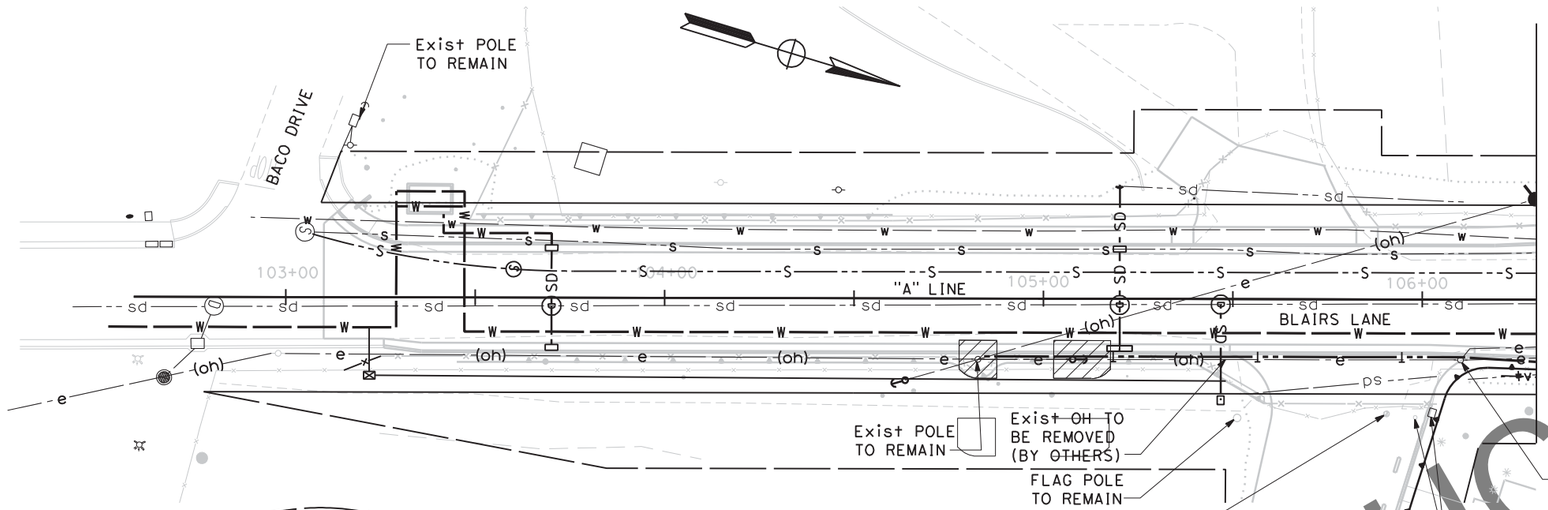
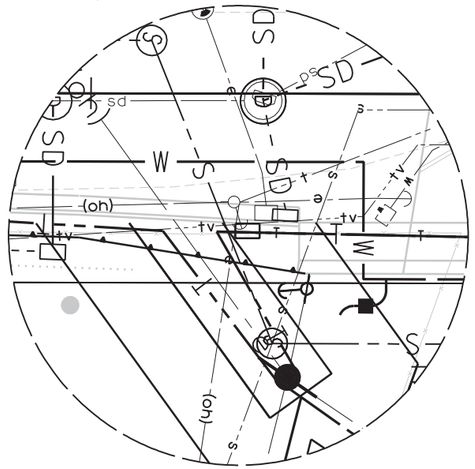
QUINCY ENGINEERING, INC
11017 Cobblerock Drive
Rancho Cordova, CA 95670

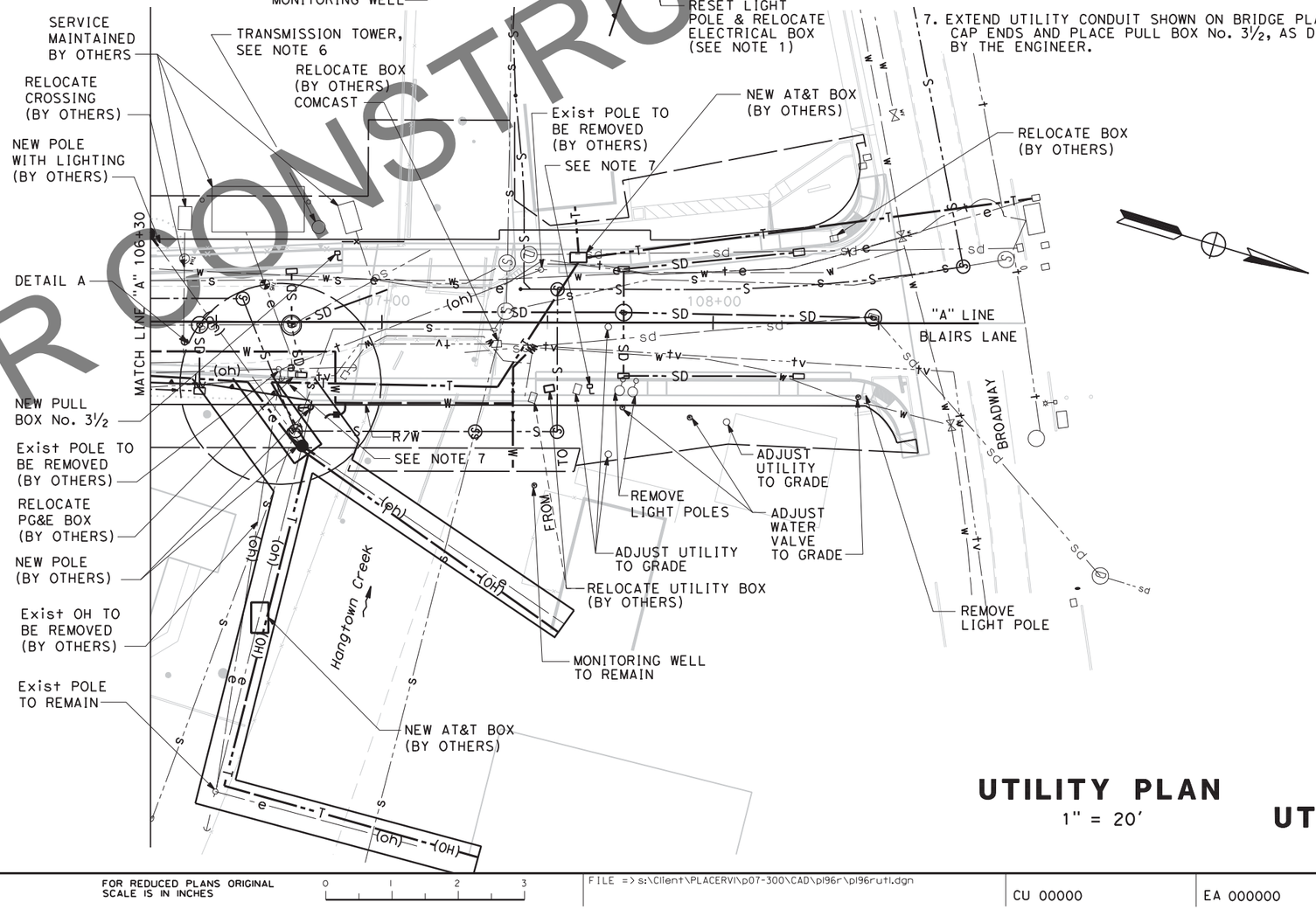
	DATE	REVISED BY	DATE REVISED
CALCULATED/ DESIGNED BY	05/07	MRR	4/12
CHECKED BY	XX	PSK	7/13
	XX/XX		

PROJECT ENGINEER: CAROLYN DAVIS

AGENCY NAME: CITY OF PLACERVILLE DEPARTMENT OF PUBLIC WORKS







LEGEND

--T——(OH)—	PROPOSED TELEPHONE OH (AT&T)
--T——T—	PROPOSED TELEPHONE UG (AT&T)
--t——t—	EXISTING TELEPHONE UG (AT&T)
--E——(OH)—	PROPOSED ELECTRIC OH (PG&E)
--E——E—	PROPOSED ELECTRIC UG (PG&E)
--e——(oh)—	EXISTING ELECTRIC OH (PG&E)
--e——e—	EXISTING ELECTRIC UG (PG&E)
--tv——tv—	EXISTING CABLE UG (COMCAST)
—W——W—	PROPOSED WATERLINE
—w——w—	EXISTING WATERLINE (CITY OF PLACERVILLE)
--S——S—	PROPOSED SANITARY SEWER
--s——s—	EXISTING SANITARY SEWER (CITY OF PLACERVILLE)
-SD——SD—	PROPOSED STORM DRAIN
-sd——sd—	EXISTING STORM DRAIN (CITY OF PLACERVILLE)
--TV——TV—	PROPOSED CABLE UG (COMCAST)

NOTES:

1. LIGHTING TO BE MAINTAINED AT ALL TIMES.
2. LOCATIONS OF UTILITY FACILITIES SHOWN ON THESE PLANS ARE APPROXIMATE AND SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION.
3. FOR COMPLETE R/W AND ACCURATE ACCESS DATA, SEE R/W MAPS AT DISTRICT OFFICE.
4. FOR DRAINAGE INFORMATION, SEE DRAINAGE SHEETS.
5. FOR SEWER AND WATER INFORMATION, SEE SEWER AND WATER SHEETS.
6. REFER TO SPECIAL PROVISIONS FOR REQUIREMENTS WHILE EXCAVATING NEAR THE TRANSMISSION TOWER.
7. EXTEND UTILITY CONDUIT SHOWN ON BRIDGE PLANS. CAP ENDS AND PLACE PULL BOX No. 3½, AS DIRECTED BY THE ENGINEER.

NOT FOR CONSTRUCTION

UTILITY PLAN

1" = 20'

UT-1

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DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
03	ED	BLAIRS Ln		24	___

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER BRYAN M. ALLEN 60764 Exp. ____ CIVIL STATE OF CALIFORNIA

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Civil Engineering Land Surveying Land Planning
3233 Monier Circle, Rancho Cordova, CA 95742
T (916) 638-0919 F (916) 638-2479 www.ctoes.net

NOTE:
THIS SHEET TO BE USED FOR SEWER AND WATER CONSTRUCTION ONLY.

SANITARY SEWER PIPE CURVE DATA

#	DELTA	RADIUS	LENGTH	SIZE
1	12°23'57"	250.00'	54.10'	6"
2	3°36'14"	250.00'	15.72'	6"
3	09°39'30"	500.00'	84.29'	15"

SEWER SERVICE NOTES:

1. LOCATION OF EXISTING PUMPED SEWER SERVICE AND EXISTING BUILDING SEWER SERVICE ARE APPROXIMATE. CONTRACTOR SHALL LOCATE FACILITIES AND IDENTIFY DEPTHS TO ENSURE THAT A MIN SLOPE OF 2% CAN BE MAINTAINED TO STA 107+42.88, 28.75' LT ELEV 1919.10. IF MIN SLOPE CANNOT BE MET THEN CONTRACTOR SHALL IMMEDIATELY NOTIFY ENGINEER.
2. CONTRACTOR SHALL PREPARE SHOP DRAWINGS OF HOW THE SEWER WILL BE CONNECTED FROM THE EX 2" PUMPED SERVICE TO THE STATION AND ELEVATION NOTED ABOVE. SHOP DRAWINGS SHALL BE SUBMITTED TO CITY FOR APPROVAL PRIOR TO CONSTRUCTION.
3. ALL EXCAVATION AND COMPACTION ACTIVITIES ARE TO BE CONDUCTED UNDER THE SUPERVISION OF AND IN ACCORDANCE WITH THE RECOMMENDATIONS OF A GEOTECHNICAL ENGINEER.
4. SURFACE TO BE REPLACED TO MATCH EXISTING.

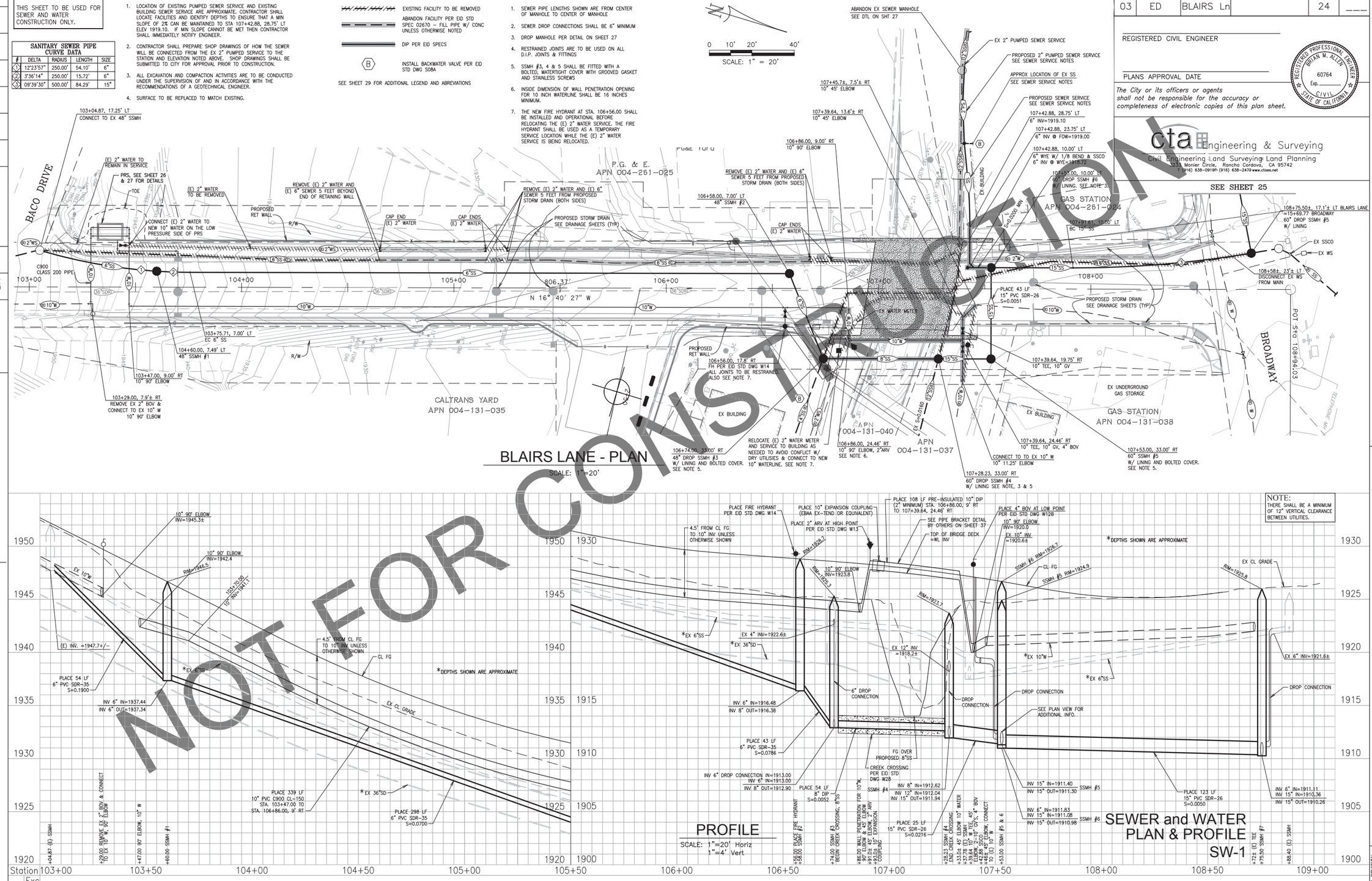
LEGEND

- EXISTING FACILITY TO BE REMOVED
- ABANDON FACILITY PER EID STD SPEC 02670 – FILL PIPE W/ CONC UNLESS OTHERWISE NOTED
- DIP PER EID SPECS
- (B) INSTALL BACKWATER VALVE PER EID STD DWG S08A

SEE SHEET 29 FOR ADDITIONAL LEGEND AND ABREVIATIONS

NOTES

1. SEWER PIPE LENGTHS SHOWN ARE FROM CENTER OF MANHOLE TO CENTER OF MANHOLE
2. SEWER DROP CONNECTIONS SHALL BE 6" MINIMUM
3. DROP MANHOLE PER DETAIL ON SHEET 27
4. RESTRAINED JOINTS ARE TO BE USED ON ALL D.I.P. JOINTS & FITTINGS
5. SSMH #3, 4 & 5 SHALL BE FITTED WITH A BOLTED, WATERTIGHT COVER WITH GROOVED GASKET AND STAINLESS SCREWS
6. INSIDE DIMENSION OF WALL PENETRATION OPENING FOR 10 INCH WATERLINE SHALL BE 16 INCHES MINIMUM.
7. THE NEW FIRE HYDRANT AT STA. 106+56.00 SHALL BE INSTALLED AND OPERATIONAL BEFORE RELOCATING THE (E) 2" WATER SERVICE. THE FIRE HYDRANT SHALL BE USED AS A TEMPORARY SERVICE LOCATION WHILE THE (E) 2" WATER SERVICE IS BEING RELOCATED.



NOTE:
THERE SHALL BE A MINIMUM OF 12" VERTICAL CLEARANCE BETWEEN UTILITIES.

SEWER and WATER PLAN & PROFILE
SW-1

NOT FOR CONSTRUCTION

DATE	REVISED BY	CALCULATED/ DESIGNED BY	CHECKED BY
		IC	BA

PROJECT ENGINEER: CAROLYN DAVIS

AGENCY NAME: CITY OF PLACERVILLE DEPARTMENT OF PUBLIC WORKS

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NOTE:
THIS SHEET TO BE USED FOR SEWER CONSTRUCTION ONLY.

SANITARY SEWER PIPE CURVE DATA

#	DELTA	RADIUS	LENGTH	SIZE
4	01°58'16"	1000.00'	34.40'	15"

LEGEND

- EXISTING FACILITY TO BE REMOVED
- ABANDON FACILITY PER EID STD SPEC 02670 – FILL PIPE W/ CONC UNLESS OTHERWISE NOTED
- DIP PER EID SPECS
- (B) INSTALL BACKWATER VALVE PER EID STD DWG 508A

NOTES

1. SEWER PIPE LENGTHS SHOWN ARE FROM CENTER OF MANHOLE TO CENTER OF MANHOLE
2. SEE SHEET 29 FOR LEGEND AND ABREVIATIONS

cta Engineering & Surveying
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3233 Monier Circle. Rancho Cordova, CA 95742
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REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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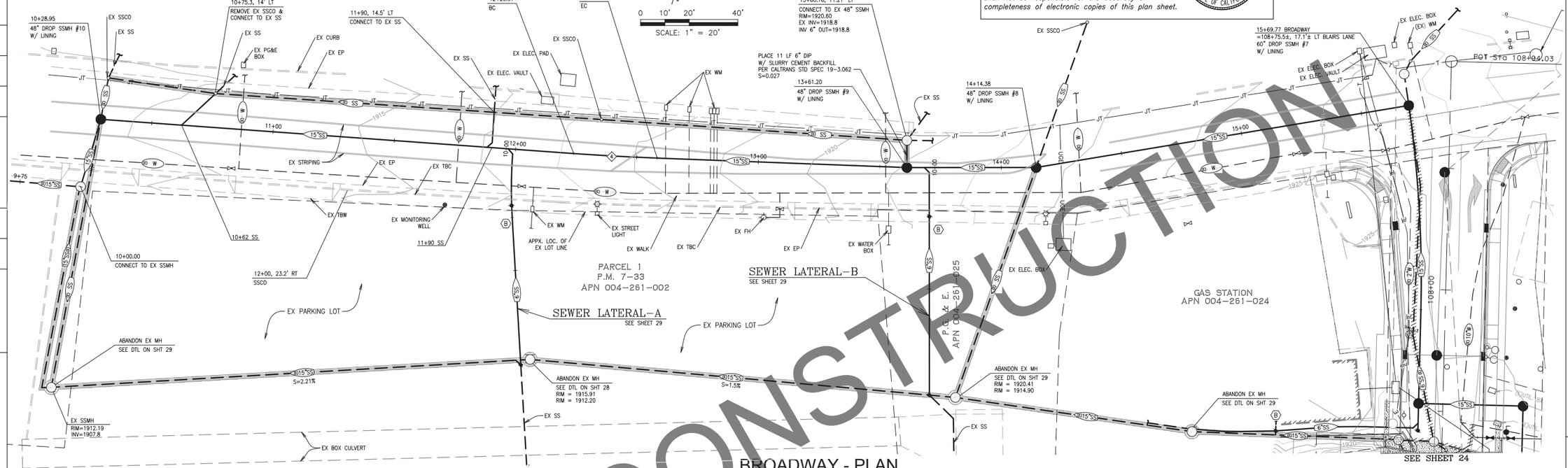
REGISTERED PROFESSIONAL ENGINEER BRIAN M. ALLEN 60764 Exp. CIVIL STATE OF CALIFORNIA

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
03	ED	BROADWAY		25	___

SCALE: 1" = 20'

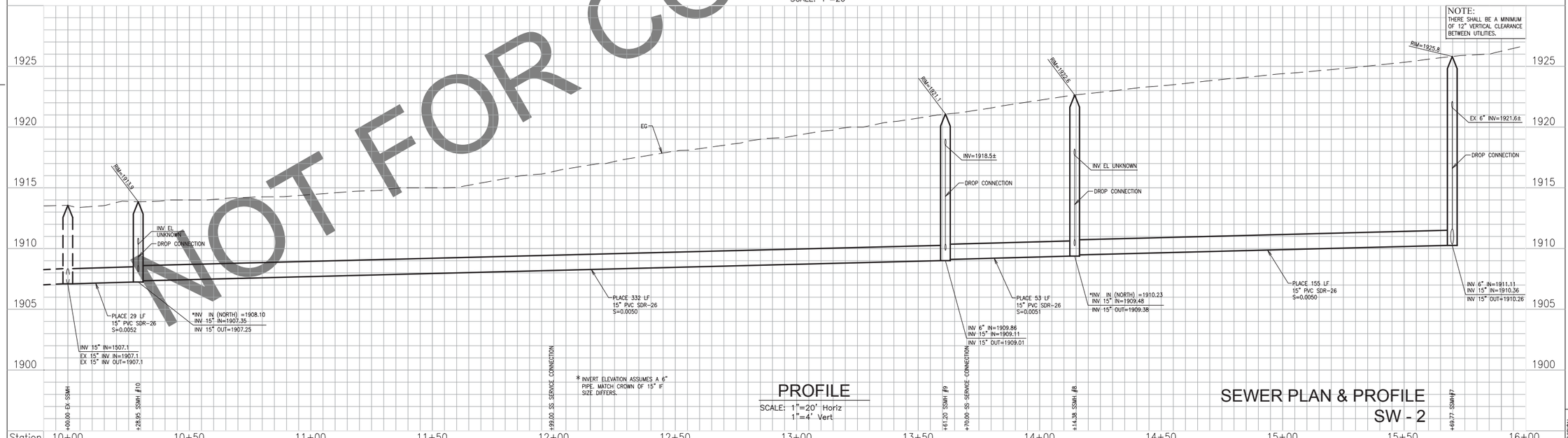


BROADWAY - PLAN

SCALE: 1"=20'

NOT FOR CONSTRUCTION

NOTE:
THERE SHALL BE A MINIMUM OF 12" VERTICAL CLEARANCE BETWEEN UTILITIES.



* INVERT ELEVATION ASSUMES A 6" PIPE. MATCH CROWN OF 15" IF SIZE DIFFERS.

PROFILE

SCALE: 1"=20' Horiz
1"=4' Vert

SEWER PLAN & PROFILE SW - 2

DATE	BY	REVISED

CALCULATED/ DESIGNED BY: IC
CHECKED BY: BA

PROJECT ENGINEER: CAROLYN DAVIS

AGENCY NAME: CITY OF PLACERVILLE DEPARTMENT OF PUBLIC WORKS

LAST REVISION: 00-00-00

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CU 00000 EA 000000

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
03	ED	BLAIRS Ln		26	___

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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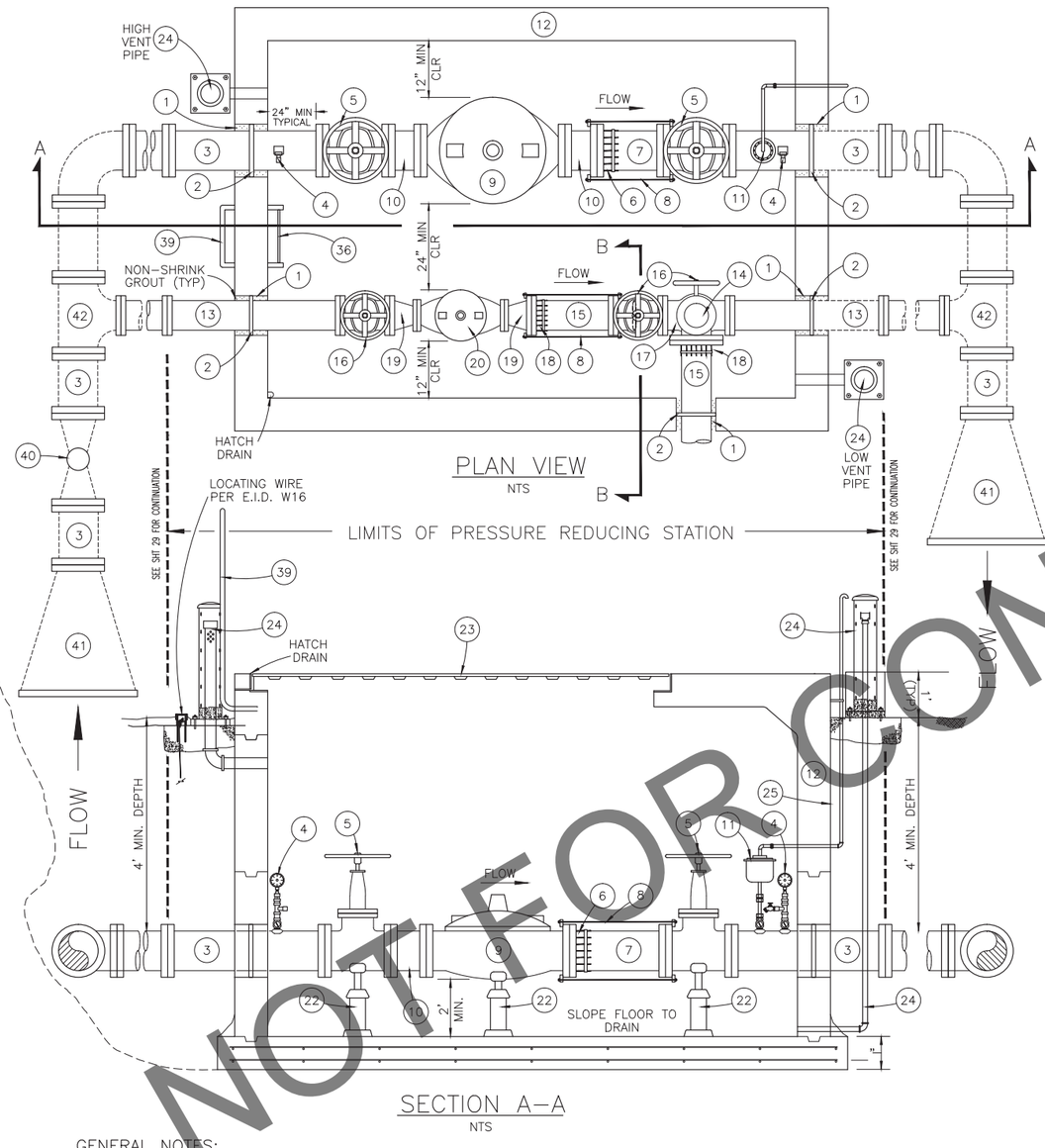
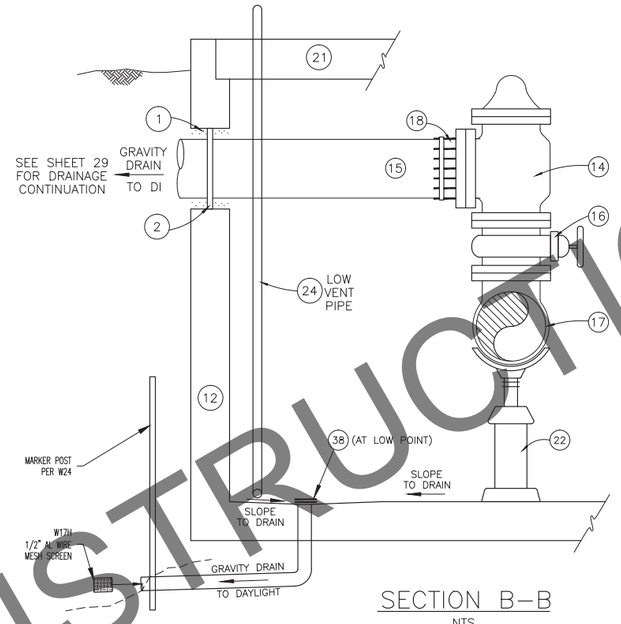
3233 Monier Circle, Rancho Cordova, CA 95742
T (916) 638-2919 ■ F (916) 638-2479 ■ www.ctaes.net

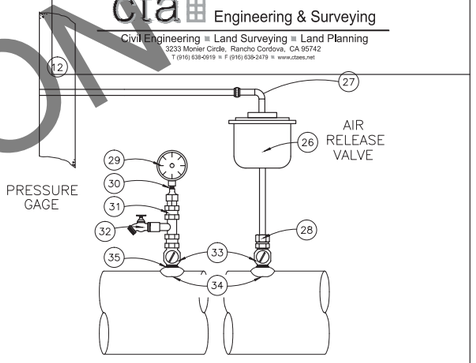


PLAN VIEW
NTS

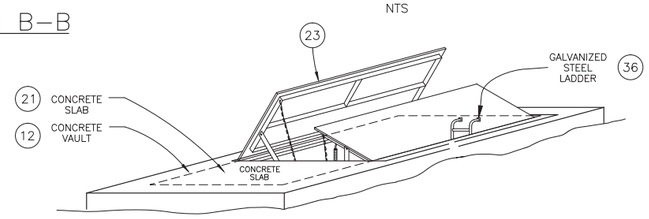
SECTION A–A
NTS



SECTION B–B
NTS



ARV – GAGE DETAIL
NTS



TOP VIEW
NTS

DESIGN CRITERIA	
UPSTREAM PRESSURE –	167 PSI
DOWNSTREAM PRESSURE –	88 PSI
MAXIMUM DESIGN FLOW –	1,500 GPM
MINIMUM DESIGN FLOW –	15 GPM

#	DESCRIPTION
1	KNOCKOUT
2	LINK SEAL OR EQUAL
3	6" FLANGED SPOOL
4	PRESSURE GAGE ASSEMBLY – SEE DETAIL ABOVE
5	6" GATE VALVE
6	6" FLANGED COUPLING ADAPTOR
7	6" FLANGED x PE SPOOL
8	RESTRAINING RODS AND LUGS, PROPERLY SIZED
9	6" PRESSURE REDUCING VALVE – CLA–VAL 90–01 GLOBE
10	6" SPOOL
11	AIR RELEASE VALVE ASSEMBLY, IF REQUIRED – SEE DETAIL ABOVE
12	6'x12' CONCRETE VAULT, JENSEN PRECAST OR EQUAL
13	4" FLANGED SPOOL
14	4" P.R.V. CLA–VAL 50–01 GLOBE W/SST–TRIM, FUSION–BONDED EPOXY COATED (UNDER 2" USE DIRECT ACTING VALVE.)
15	4" FLANGED SPOOL
16	4" GATE VALVE
17	4"x4"x4" FLANGED TEE
18	4" FLANGED COUPLING ADAPTOR
19	4"x2" FLANGED REDUCER
20	2" P.R.V. CLA–VAL 90–01 GLOBE
21	CONCRETE SLAB
22	ADJUSTABLE PIPE SUPPORT

#	DESCRIPTION
23	DOUBLE–LEAF ACCESS HATCH W/ RECESSED PADLOCK HASPS, HOLD OPEN ARM, BILCO JD–AL SERIES, PA INSERT OR EQUAL. WATERTIGHT CONSTRUCTION/DRAIN CHANNEL. LABELED RECYCLED WATER
24	2" VENT PIPE, SEE E.I.D. DWG No. W13, SEE NOTE 5.
25	COAT EXTERIOR WITH 12 MILS BITUMINOUS MASTIC
26	1" COMBINATION AIR RELEASE VALVE, SEE E.I.D. DWG No. W13 FOR EXHAUST PIPING
27	GALVANIZED PIPE AND FITTINGS AS REQUIRED
28	INSULATED COUPLING
29	AMETEK 535L PRESSURE GAGE, UPSTREAM GAGE 0–300 PSI SCALE DOWNSTREAM GAGE 0–150 PSI SCALE
30	1" BRASS NIPPLE
31	1" BRASS COUPLING W/1–1/4" BRASS BUSHING
32	1" TEE WITH HOSEBIB, ALL BRASS
33	1" CORPORATION STOP, W/F.I.P. OUTLET
34	EXTRA HEAVY WELDED HALF–COUPLING SIZED TO INCLUDE SSTL BUSHING
35	STAINLESS STEEL BUSHING
36	ROUGH GALVANIZED LADDER PER CAL/OSHA STANDARDS WITH NON–SKID SURFACE ON ALL RUNGS WITH EZ UP.
37	ZERN Z–320–V FLOOR DRAIN WITH BACKWATER VALVE
38	PVC PIPE–2" MIN WITH LONG SWEEP AND 1/2" AL SCREEN
39	SIDE RAIL PER CAL/OSHA STANDARDS.
40	CLA–VAL 6" MODEL 40–01
41	6"x10" REDUCER
42	6"x6"x4" TEE

GENERAL NOTES:

1. COMPONENTS, FITTINGS AND OTHER DETAILS SHOWN HEREON, HAVE BEEN DRAWN TO APPROXIMATE DIMENSIONS. SHOP DRAWINGS SHALL BE SUBMITTED TO THE DISTRICT FOR APPROVAL PRIOR TO CONSTRUCTION. SHOP DRAWINGS SHALL SHOW COMPLETE DETAILS OF THE INSTALLATION INCLUDING SIZE, LOCATION, MANUFACTURERS NAME, MODEL, DIMENSIONAL AND ENGINEERING DATA OF ALL COMPONENTS.
2. UNLESS OTHERWISE NOTED, ALL PIPE AND PIPE FITTINGS INSIDE VAULT SHALL BE SHOP MANUFACTURED AND WELDED STEEL FABRICATED IN ACCORDANCE WITH A.W.W.A. STANDARD C200–80, & SHALL BE LINED & COATED WITH FUSION–BONDED EPOXY IN ACCORDANCE WITH A.W.W.A. STANDARD C213. ALL EXTERIOR SURFACES TO BE BLUE.
3. SEE SITE PLAN FOR LOCATION OF DRAIN AND PRESSURE RELIEF LINE ALIGNMENTS AND OUTLETS.
4. ALL PIPES, FITTINGS, VALVES AND OTHER APPURTENANCES ON UPSTREAM SIDE OF PRESSURE REDUCING VALVES SHALL HAVE A WORKING PRESSURE RATING OF NOT LESS THAN 250 P.S.I. EXCEPT AS NOTED, ALL END CONNECTIONS TO BE 125# EXCEPT AS NOTED.
5. BOTH VENT PIPES SHALL BE CONSTRUCTED USING E.I.D. STD. WATER DETAIL R13. THE HIGH VENT PIPE SHALL BE CONSTRUCTED SO AS TO VENT THE TOP OF THE VAULT, THE LOW VENT PIPE SHALL BE CONSTRUCTED SO AS TO VENT THE BOTTOM OF THE VAULT.

NOT FOR CONSTRUCTION

DATE | REVISED BY | REVISED
IC | BA
CALCULATED/ DESIGNED BY | CHECKED BY

PROJECT ENGINEER: CAROLYN DAVIS

AGENCY NAME: CITY OF PLACERVILLE DEPARTMENT OF PUBLIC WORKS

PRV - 1
PRESSURE REDUCING STATION

LAST REVISION 00–00–00

FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

CU 00000 | EA 000000

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
03	ED	BLAIRS Ln		27	___

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER BRYAN M. ALLEN 60764 Exp. _____ CIVIL STATE OF CALIFORNIA

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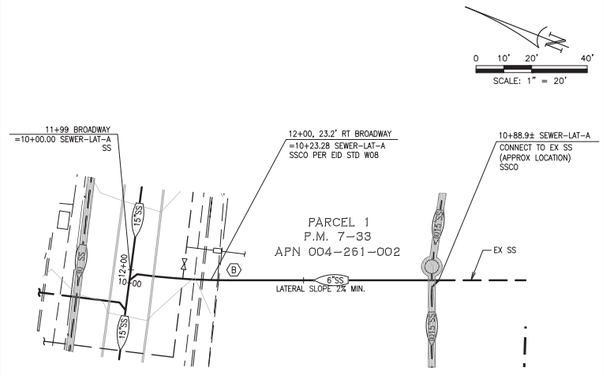
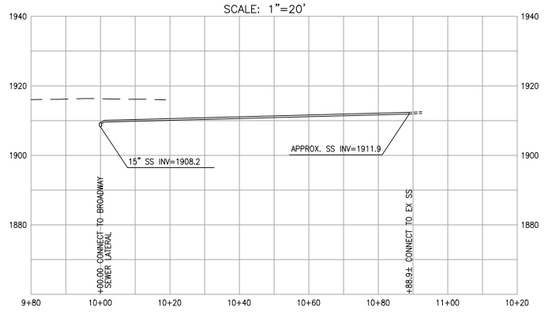
cta Engineering & Surveying
Civil Engineering ▪ Land Surveying ▪ Land Planning
3233 Monier Circle, Rancho Cordova, CA 95742
T (916) 638-3919 ▪ F (916) 638-2479 ▪ www.ctaes.net

NOT FOR CONSTRUCTION

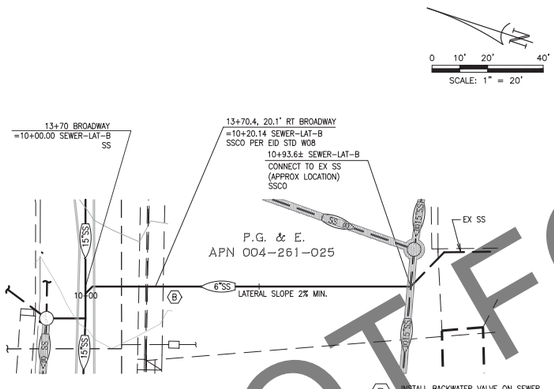
SEWER LATERAL - A



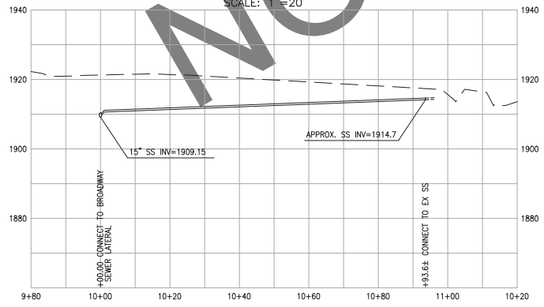
SCALE: 1"=20'



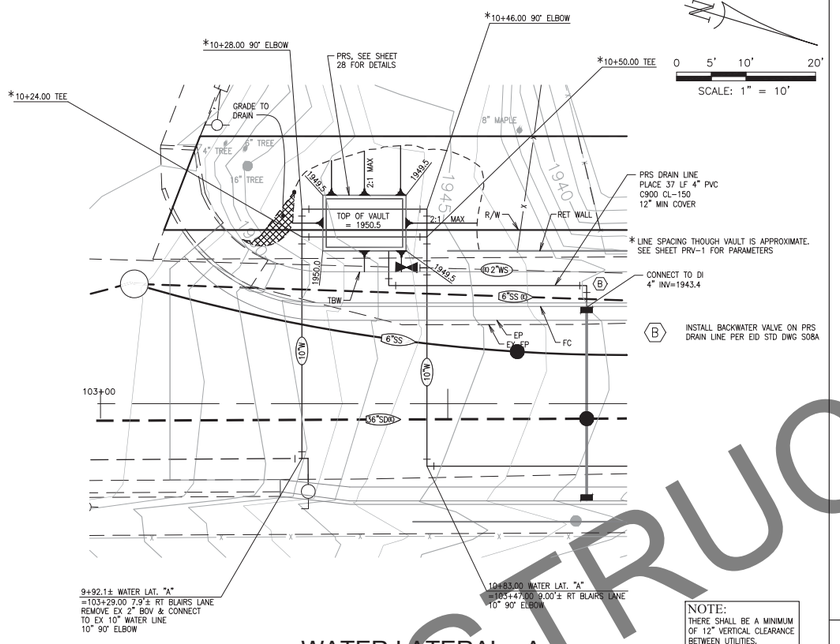
SEWER LATERAL - B



SCALE: 1"=20'

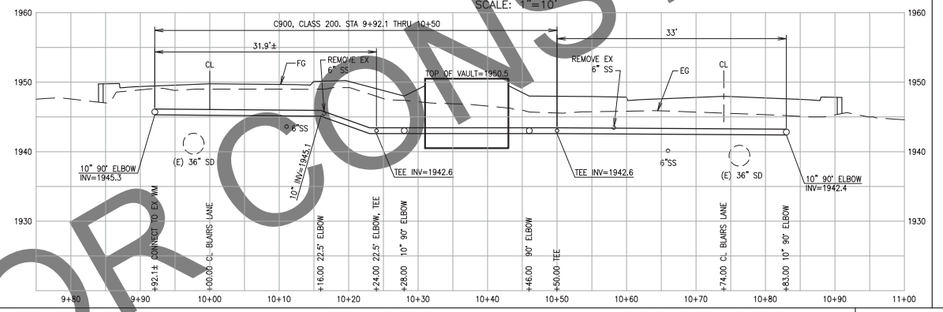


WATER LATERAL - A



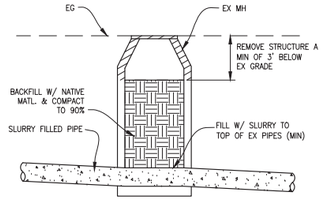
NOTE:
THERE SHALL BE A MINIMUM OF 12" VERTICAL CLEARANCE BETWEEN UTILITIES.

SCALE: 1"=10'



ABBREVIATIONS

AB	AGGREGATE BASE
AC	ASPHALT CONCRETE
ARV	AIR RELIEF VALVE
BC	BEGIN CURVE
BDRY	BOUNDARY
BF	BLIND FLANGE
BOV	BLOW OFF VALVE
BV	BUTTERFLY VALVE
BW	BOTTOM OF WALL
C&G	CURB & GUTTER
CL	CENTERLINE
CMP	CORRUGATED METAL PIPE
CONST	CONSTRUCT
CO	CLEAN OUT
CR RT	CURB RETURN
DI	DRAIN INLET
DIP	DUCTILE IRON PIPE
DWG	DRAWING
E.A.R.	EMERGENCY ACCESS ROAD
EP	EDGE OF PAVEMENT
EX	EXISTING
ESMT	EASEMENT
EC	END CURVE
FES	FLARED END SECTION
FC	FACE OF CURB
FH	FIRE HYDRANT
FL	FLOW LINE
FOW	FACE OF WALL
FS	FINISHED SURFACE
GR	GRATE
GV	GATE VALVE
HDC	HIGH DEFLECTION COUPLING
HDPE	HIGH DENSITY POLYETHYLENE
HP	HIGH POINT
INTX	INTERSECTION
INV	INVERT ELEVATION
LF	LINEAR FEET
LIP	LIP OF GUTTER
LP	LOW POINT
MH	MANHOLE
NTS	NOT TO SCALE
(P)	PROPOSED
POC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVATURE
PL	PROPERTY LINE
POC	POINT OF CONNECTION
PRC	POINT OF REVERSE CURVATURE
PT	POINT OF TANGENCY
PUE	PUBLIC UTILITY EASEMENT
PVC	POLYVINYL CHLORIDE
RCP	REINFORCED CONCRETE PIPE
R	RADIUS
RW	RECYCLED WATER
R/W	RIGHT-OF-WAY
SS	SEWER
SBL	SET BACK LINE
SD	STORM DRAIN
SDMH	STORM DRAIN MANHOLE
SSMH	SEWER MANHOLE
STA	STATION
STD	STANDARD
TBC	TOP BACK OF CURB
TBW	TOP BACK OF WALK
TC	TOP OF CURB
TOE	TOE OF SLOPE
TOP	TOP OF SLOPE
TW	TOP OF WALL
TYP	TYPICAL
W	WATER LINE



STRUCTURE ABANDONMENT DETAIL

NOT TO SCALE

LEGEND

GRADING & DRAINAGE

PROPOSED		EXISTING
TOE	CUT OR FILL SLOPE	TOP TOE
18"SD	PIPE SHOWING DIRECTION OF FLOW & PIPE SIZE	18"SD(E)
	MANHOLE (MH)	
	DROP INLET (DI)	

SEWER

6"SS	PIPE SHOWING DIRECTION OF FLOW & PIPE SIZE	8"SS (E)
	MANHOLE (MH)	
1:4.00 6"SS	CLEANOUT	
6"SS	SANITARY SEWER SERVICE (SS) WYE IN DIRECTION OF FLOW	6"SS (E)

WATER

8"W	WATER MAIN (WM)	8"W
	GATE VALVE	
	BUTTERFLY VALVE	
	FIRE HYDRANT (FH)	
2"	BLOW OFF VALVE (BOV)	2"
2"	AIR RELIEF VALVE (ARV)	2"
	REDUCER	
	WATER SERVICE (WS)	
2"	PRESSURE RELIEF VALVE	2"
	CAP	
	BLIND FLANGE	
	BENDS	
	TEE & CROSS	
	RP BACKFLOW DEVICE	

SEWER NOTES:

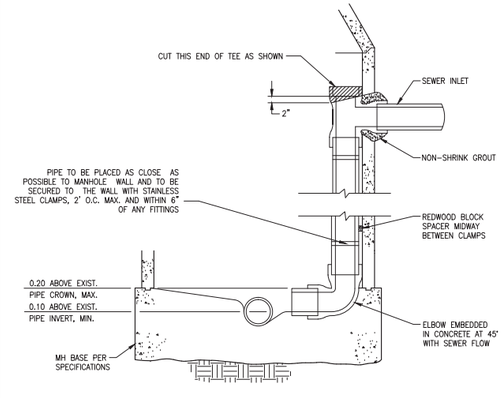
1. ALL WORK WILL BE SUBJECT TO INSPECTION AND APPROVAL BY THE CITY OF PLACERVILLE. ALL CONSTRUCTION SHALL CONFORM TO THESE PLANS AND EL DORADO IRRIGATION DISTRICT'S (E.I.D.) LATEST VERSION OF THE TECHNICAL SPECIFICATIONS AND STANDARD DRAWINGS.
2. CONTRACTOR SHALL SCHEDULE A PRE CONSTRUCTION CONFERENCE WITH INSPECTION (5) WORKING DAYS IN ADVANCE OF DOING WORK WITHIN THEIR JURISDICTION. CONSTRUCTION SHALL BE STARTED NO LATER THAN FIVE (5) DAYS AFTER THE PRE CONSTRUCTION CONFERENCE.
3. LOCATION OF ALL UNDERGROUND FACILITIES ARE APPROXIMATE ONLY – THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION AND DEPTH OF ALL FACILITIES PRIOR TO ANY EXCAVATION.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND PROTECTING ALL UNDERGROUND FACILITIES AFFECTED BY THE WORK AND SHALL CONTACT UNDERGROUND SERVICES ALERT (USA) 48 HOURS PRIOR TO ANY EXCAVATION WORK FOR DETERMINATION AND LOCATION OF UNDERGROUND UTILITIES (PHONE 1-800-642-2444).
5. CONNECTIONS TO EXISTING SEWER FACILITIES SHALL BE DONE BY A LICENSED CONTRACTOR IN ACCORDANCE WITH EID TIE-IN PROCEDURES PER TECHNICAL SPECIFICATION 01000.
6. WHERE EXCAVATIONS FOR ANY FACILITIES CONSTRUCTION EXCEED 5 FEET IN DEPTH, CONTRACTOR SHALL OBTAIN AN EXCAVATION PERMIT FORM CAL/OSHA IN SACRAMENTO (PHONE 1-916-920-6123).
7. THE CONTRACTOR SHALL NOTIFY THE FOLLOWING PARTIES BY THE TIME SPECIFIED PRIOR TO BEGINNING WORK: CITY OF PLACERVILLE DEPARTMENT OF PUBLIC WORKS – 48 HOURS
8. ALL LIDS SHALL BE MARKED "SEWER".
9. ALL CURBS SHALL BE MARKED WITH A "S" BRAND WHERE SEWER SERVICES INTERCEPT.
10. CONTRACTOR SHALL HAVE A COPY OF THE DISTRICT'S CONSTRUCTION STANDARDS ON THE JOB.
11. ALL REVISIONS TO THESE DRAWINGS MUST BE APPROVED IN WRITING BY THE CITY.

WATER NOTES:

1. ALL WORK WILL BE SUBJECT TO INSPECTION AND APPROVAL BY THE CITY OF PLACERVILLE. ALL CONSTRUCTION SHALL CONFORM TO THESE PLANS AND EL DORADO IRRIGATION DISTRICT'S (E.I.D.) LATEST VERSION OF THE TECHNICAL SPECIFICATIONS AND STANDARD DRAWINGS.
2. CONTRACTOR SHALL SCHEDULE A PRE CONSTRUCTION CONFERENCE WITH INSPECTION (5) WORKING DAYS IN ADVANCE OF DOING WORK WITHIN THEIR JURISDICTION. CONSTRUCTION SHALL BE STARTED NO LATER THAN FIVE (5) DAYS AFTER THE PRE CONSTRUCTION CONFERENCE.
3. LOCATION OF ALL UNDERGROUND FACILITIES ARE APPROXIMATE ONLY – THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION AND DEPTH OF ALL FACILITIES PRIOR TO ANY EXCAVATION.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND PROTECTING ALL UNDERGROUND FACILITIES AFFECTED BY THE WORK AND SHALL CONTACT UNDERGROUND SERVICES ALERT (USA) 48 HOURS PRIOR TO ANY EXCAVATION WORK FOR DETERMINATION AND LOCATION OF UNDERGROUND UTILITIES (PHONE 1-800-642-2444).
5. CONNECTIONS TO EXISTING WATER FACILITIES SHALL BE DONE BY A LICENSED CONTRACTOR IN ACCORDANCE WITH EID TIE-IN PROCEDURES PER TECHNICAL SPECIFICATION 01000.
6. WHERE EXCAVATIONS FOR ANY FACILITIES CONSTRUCTION EXCEED 5 FEET IN DEPTH, CONTRACTOR SHALL OBTAIN AN EXCAVATION PERMIT FORM CAL/OSHA IN SACRAMENTO (PHONE 1-916-920-6123).
7. THE CONTRACTOR SHALL NOTIFY THE FOLLOWING PARTIES BY THE TIME SPECIFIED PRIOR TO BEGINNING WORK: CITY OF PLACERVILLE DEPARTMENT OF PUBLIC WORKS – 48 HOURS
8. ONLY CITY PERSONNEL SHALL OPERATE ANY VALVES ON EXISTING WATER SYSTEM.
9. ALL PIPELINES SHALL BE STERILIZED, FLUSHED, AND PRESSURE TESTED IN ACCORDANCE WITH EID'S STANDARDS.
10. ALL LIDS SHALL BE MARKED "WATER".
11. ALL CURBS SHALL BE MARKED WITH A "W" BRAND WHERE WATER SERVICES INTERCEPT.
12. CONTRACTORS SHALL HAVE A COPY OF THE DISTRICT'S CONSTRUCTION STANDARDS ON THE JOB.
13. REVISIONS TO THESE DRAWINGS MUST BE APPROVED IN WRITING BY THE CITY.

PROJECT NOTES

1. THE LOCATIONS OF ALL UNDERGROUND FACILITIES SHOWN ON THIS PLAN ARE APPROXIMATE. A REASONABLE EFFORT HAS BEEN MADE TO LOCATE AND DELINEATE ALL UNDERGROUND FACILITIES; HOWEVER, CTA ENGINEERING & SURVEYING, ASSUMES NO LIABILITY FOR THE ACCURACY OR COMPLETENESS OF THE EXISTING FACILITIES SHOWN HEREON OR FOR THE EXISTENCE OF OTHER UNDERGROUND UTILITIES OR OBJECTS WHICH MAY BE DISCOVERED BUT ARE NOT SHOWN ON THESE PLANS. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING FACILITIES AND IMMEDIATELY NOTIFY THE ENGINEER IF ANY SUCH FACILITIES INTERFERE WITH THE CONSTRUCTION OF IMPROVEMENTS OR DO NOT MATCH PLAN.
2. PRIOR TO ANY CORRECTIVE ACTION BY THE CONTRACTOR WHICH MAY BE NECESSARY DUE TO ALLEGED DESIGN OR STAKING ERRORS OR OMISSIONS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER FOR VERIFICATION AND RESTAKING IF NECESSARY. CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY, IN WRITING, OF ANY ANTICIPATED OR ACTUAL DELAYS ASSOCIATED WITH SAID ERRORS OR OMISSIONS.
3. CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING SURVEY MONUMENTS AND OTHER SURVEY MARKERS. MONUMENTS AND SURVEY MARKERS DESTROYED DURING CONSTRUCTION SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.
4. CTA ENGINEERING & SURVEYING ASSUMES NO RESPONSIBILITY FOR ANY CONSTRUCTION WORK STAKED BY OTHERS.
5. CONTRACTOR SHALL BE RESPONSIBLE FOR RECORDING ALL FINAL CHANGES AS THEY RELATE TO THE SEWER & WATER FACILITIES. AT PROJECT COMPLETION THE CONTRACTOR SHALL FURNISH A RED LINE SET OF PLANS CLEARLY IDENTIFYING CHANGES TO QUINCY ENGINEERING.
6. EXISTING PAVEMENT MARKINGS, DELINEATIONS & SIGNS THAT MAY BE IN CONFLICT WITH THE BROADWAY SEWER LINES SHALL BE REMOVED AND REPLACED AS DIRECTED BY THE CITY.



INTERIOR DROP CONNECTION

NOT TO SCALE

NOTES:

1. ALL INSIDE DROP PIPING TO BE P.V.C. CEMENTED.
2. CONSTRUCT BASE AND MANHOLE PER SPECIFICATIONS.
3. DROP CONNECTION PIPE AND FITTINGS TO BE SAME SIZE AS LATERAL.
4. CLAMPS TO BE 1 1/2" GA. STAINLESS STEEL, ANCHORED TO MANHOLE WALL WITH 2 1/2" CADMIUM PLATED BOLTS.
5. IF LATERAL IS ENCASED IN STEEL PIPE CASING, PIPE CASING TO END AT OUTSIDE WALL OF MH WITH OUTSIDE EDGE TO BE PACKED WITH MORTAR.
6. CONTRACTOR MUST USE INTERIOR DROP MANHOLES WHEN DESIGNATED AS "DROP SSMH" PER PLANS.

SEWER and WATER NOTES & DETAILS

SWD - 1

LAST REVISION 00-00-00

DATE	BY	REVISED

CALCULATED/ DESIGNED BY
IC

CHECKED BY
BA

PROJECT ENGINEER
CAROLYN DAVIS

AGENCY NAME
CITY OF PLACERVILLE DEPARTMENT OF PUBLIC WORKS

FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

CU 00000

EA 000000

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
03	ED	BLAIRS LN			

100% SUBMITTAL

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — C. Davis — No. C58440 — Exp. 12/31/16 — CIVIL — STATE OF CALIFORNIA

The Identity or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

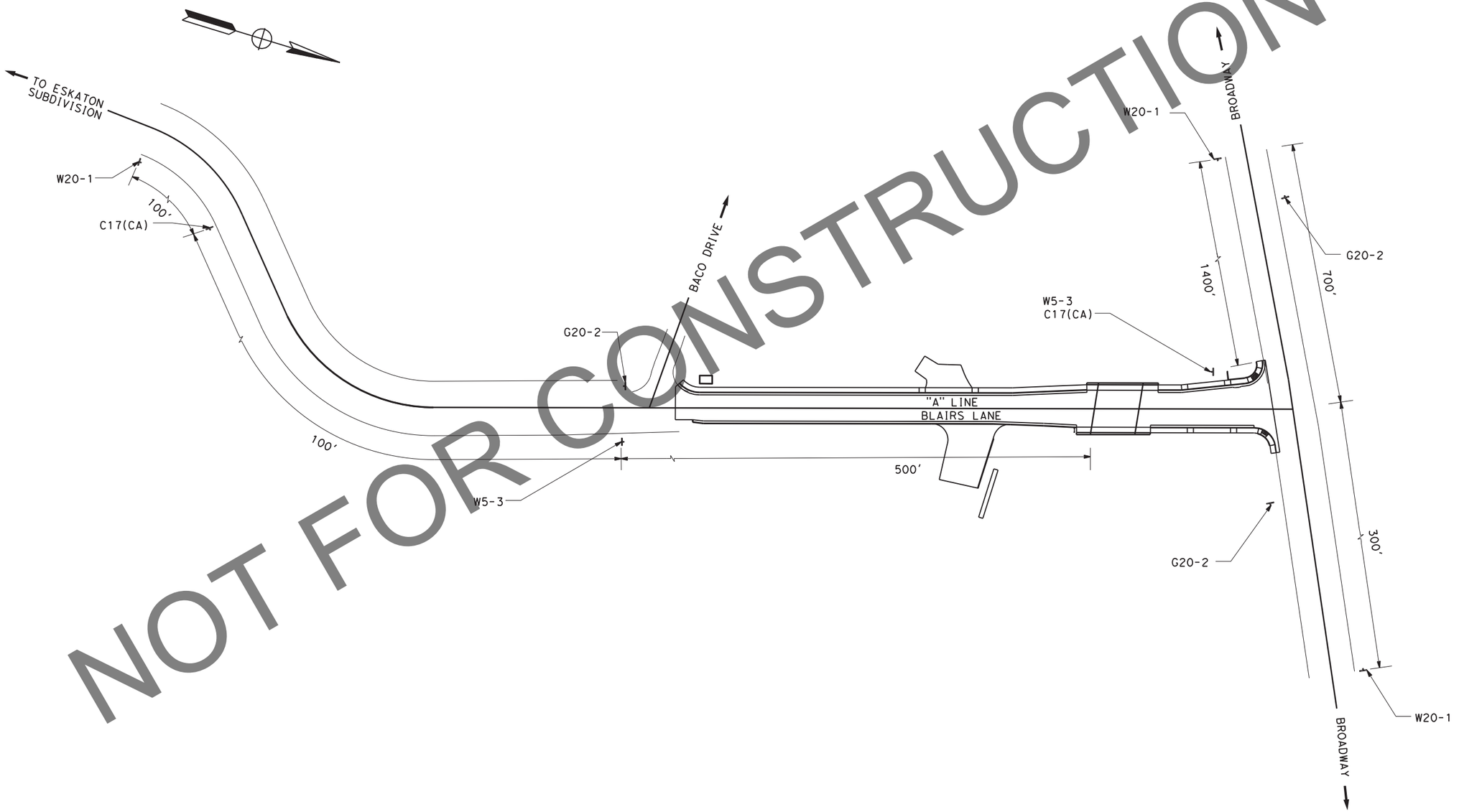
QUINCY ENGINEERING, INC
11017 Cobblerock Drive
Rancho Cordova, CA 95670

NOTES:

1. THIS PLAN ACCURATE FOR CONSTRUCTION AREA SIGN WORK ONLY.
2. FOR ADDITIONAL CONSTRUCTION AREA SIGNS, SEE TRAFFIC HANDLING SHEET.
3. SIGN LOCATIONS SHOWN ARE APPROXIMATE. EXACT LOCATIONS TO BE DETERMINED BY THE ENGINEER.

CONSTRUCTION AREA SIGNS (STATIONARY MOUNTED)

SIGN CODE	PANEL SIZE	SIGN MESSAGE	NUMBER OF SIGNS	NUMBER OF POSTS AND SIZE
	INCHES		EACH	INCHES
G20-2	36x18	END ROAD WORK	3	1-4x4
W20-1	36x36	ROAD WORK AHEAD	3	1-4x6
C17(CA)	24x24	ROAD WORK SPEED LIMIT 20 MPH	2	1-4x6
W5-3	36x36	ONE LANE BRIDGE	2	1-4x6
TOTAL			10	



NOT FOR CONSTRUCTION

CONSTRUCTION AREA SIGNS

NO SCALE

CS-1

CALCULATED/ DESIGNED BY	VFD	DATE 05/07	REVISED BY	MRR	PSK
CHECKED BY	XX	XX/0X	DATE REVISED	4/12	7/13

AGENCY NAME: CITY OF PLACERVILLE DEPARTMENT OF PUBLIC WORKS

PROJECT ENGINEER: CAROLYN DAVIS

FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

FILE => s:\Client\PLACERVI\p07-300\CAD\pl96r\pl96rcsl.dgn

CU 00000 EA 000000

LAST REVISION 00-00-00 DATE PLOTTED => 3/11/2015 TIME PLOTTED => 3:48:23 PM

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
03	ED	BLAIRS LN			

100% SUBMITTAL

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — C. Davis — No. C58440 — Exp. 12/31/16 — CIVIL — STATE OF CALIFORNIA

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QUINCY ENGINEERING, INC
11017 Cobblerock Drive
Rancho Cordova, CA 95670

CALCULATED/ DESIGNED BY	CHECKED BY	VFD	DATE	REVISED BY	DATE REVISED
		XX	XX/0X		
			05/07		
				MRR	4/12
				PSK	7/13

PROJECT ENGINEER: CAROLYN DAVIS

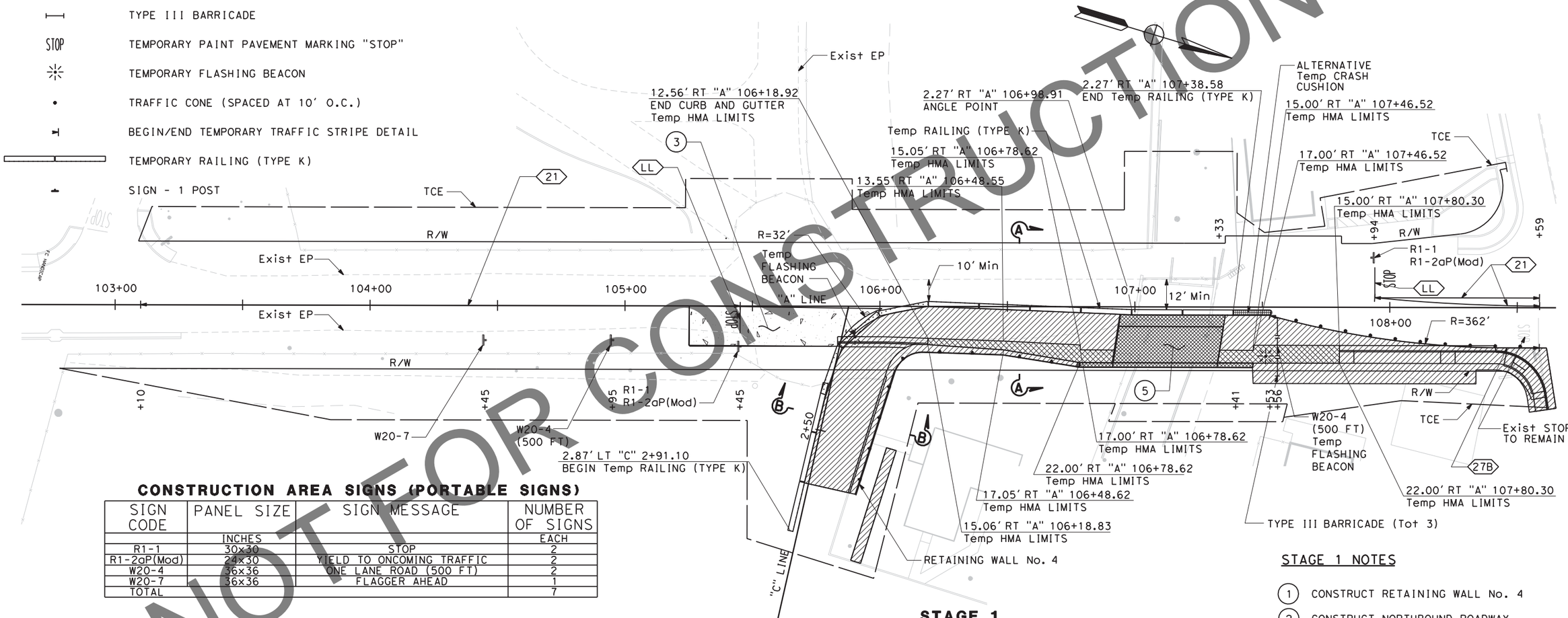
AGENCY NAME: CITY OF PLACERVILLE DEPARTMENT OF PUBLIC WORKS

LEGEND

- WORK AREA (ROAD)
- WORK AREA (BRIDGE)
- WORK AREA (TEMPORARY)
- BARRIER MARKER (TYPE F)
- LL — LIMIT LINE
- X — TEMPORARY PAINT TRAFFIC STRIPE DETAIL No.
- TYPE III BARRICADE
- STOP — TEMPORARY PAINT PAVEMENT MARKING "STOP"
- TEMPORARY FLASHING BEACON
- TRAFFIC CONE (SPACED AT 10' O.C.)
- BEGIN/END TEMPORARY TRAFFIC STRIPE DETAIL
- TEMPORARY RAILING (TYPE K)
- SIGN - 1 POST

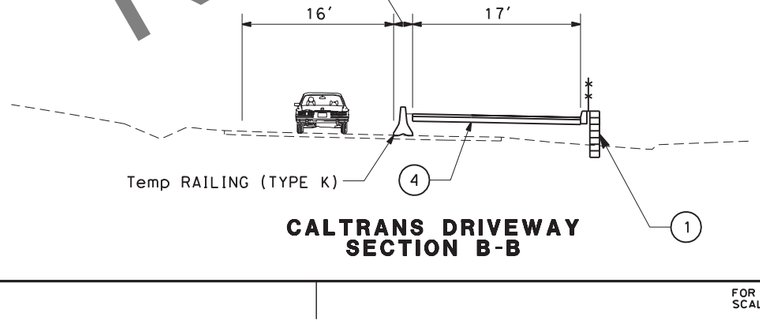
NOTES:

1. THIS PLAN ACCURATE FOR TRAFFIC HANDLING WORK ONLY.
2. SIGN LOCATIONS SHOWN ARE APPROXIMATE. EXACT LOCATIONS TO BE DETERMINED BY ENGINEER.
3. SEE CONSTRUCTION AREA SIGNS PLAN FOR ADDITIONAL CONSTRUCTION AREA SIGNS.
4. TEMPORARY RAILING (TYPE K) SHALL HAVE SCUPPERS TO ALLOW DRAINAGE RELIEF.
5. STATION AND OFFSETS OF TEMPORARY RAILING (TYPE K) ARE LOCATED AT THE CENTER LINE OF THE RAILING.
6. TEMPORARY RAILING (TYPE K) SHALL BE PINNED PER STANDARD PLANS.
7. DRIVEWAY ACCESS SHALL BE MAINTAINED AT ALL TIMES.
8. COORDINATE WITH UTILITY OWNERS PER SPECIFICATIONS PRIOR TO STARTING WORK.
9. SEWER AND WATER SERVICE TO BE MAINTAINED THROUGH ALL STAGES OF CONSTRUCTION.



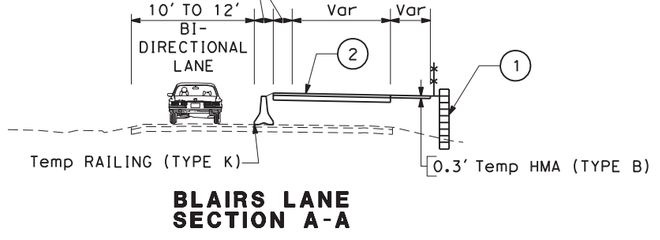
CONSTRUCTION AREA SIGNS (PORTABLE SIGNS)

SIGN CODE	PANEL SIZE	SIGN MESSAGE	NUMBER OF SIGNS
	INCHES		EACH
R1-1	30x30	STOP	2
R1-2aP(Mod)	24x30	YIELD TO ONCOMING TRAFFIC	2
W20-4	36x36	ONE LANE ROAD (500 FT)	2
W20-7	36x36	FLAGGER AHEAD	1
TOTAL			7



CALTRANS DRIVEWAY SECTION B-B

STAGE 1



BLAIRS LANE SECTION A-A

STAGE 1 NOTES

1. CONSTRUCT RETAINING WALL No. 4
2. CONSTRUCT NORTHBOUND ROADWAY. PLACE 0.3' TEMPORARY HMA (TYPE B).
3. CONSTRUCT Temp TRANSITION AFTER COMPLETION OF STAGE 1
4. CONSTRUCT NORTHERN PORTION OF CALTRANS DRIVEWAY
5. REMOVE BRIDGE PORTION AND CONSTRUCT BRIDGE PORTION (SEE BRIDGE PLANS)

TRAFFIC HANDLING

1" = 20'

TH-1

NOT FOR CONSTRUCTION

LAST REVISION 00-00-00 — DATE PLOTTED => 3/11/2015 — TIME PLOTTED => 4:29:17 PM

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CU 00000 EA 000000

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
03	ED	BLAIRS LN		30	55

100% SUBMITTAL

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

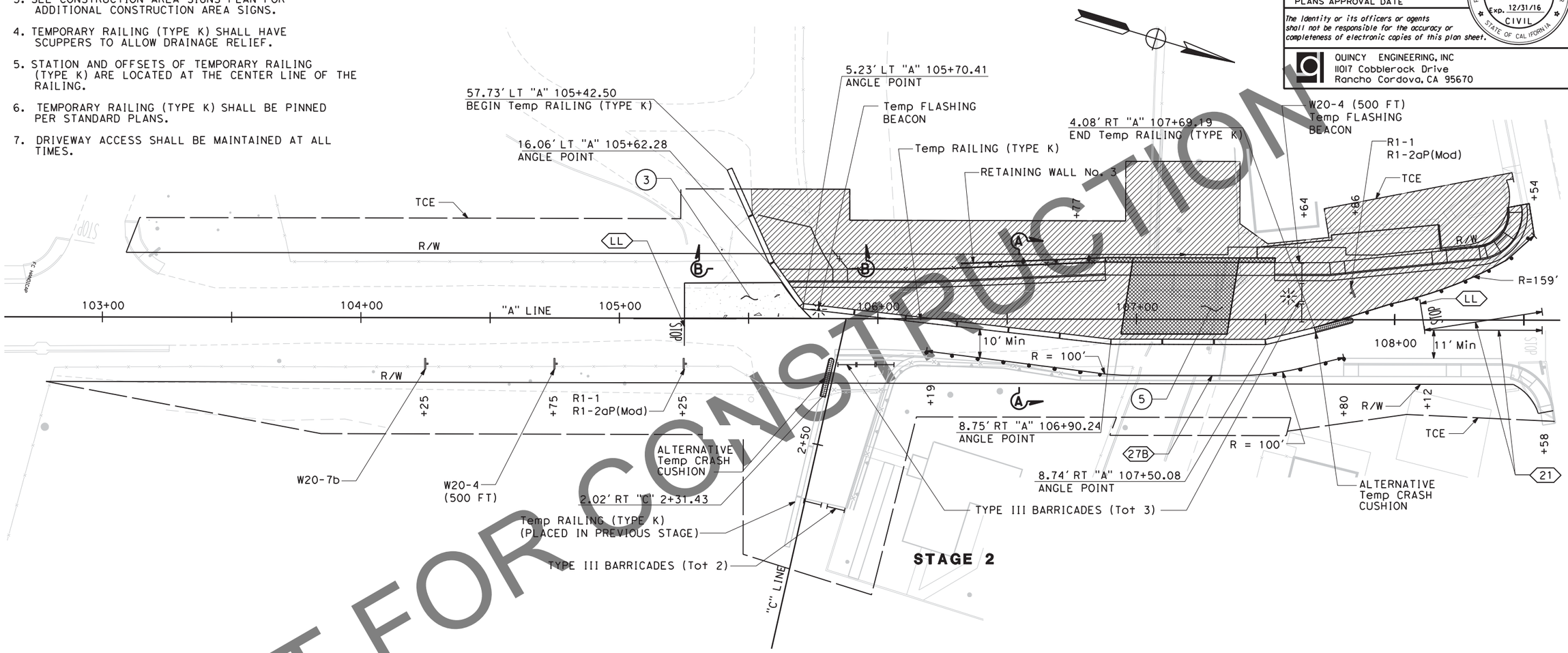
REGISTERED PROFESSIONAL ENGINEER — C. Davis — No. C58440 — Exp. 12/31/16 — CIVIL — STATE OF CALIFORNIA

The Identity or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

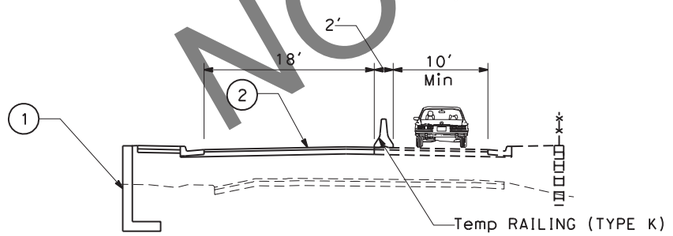
QUINCY ENGINEERING, INC
11017 Cobblerock Drive
Rancho Cordova, CA 95670

NOTES:

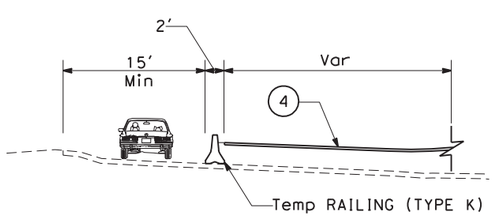
1. THIS PLAN ACCURATE FOR TRAFFIC HANDLING WORK ONLY.
2. SIGN LOCATIONS SHOWN ARE APPROXIMATE. EXACT LOCATIONS TO BE DETERMINED BY ENGINEER.
3. SEE CONSTRUCTION AREA SIGNS PLAN FOR ADDITIONAL CONSTRUCTION AREA SIGNS.
4. TEMPORARY RAILING (TYPE K) SHALL HAVE SCUPPERS TO ALLOW DRAINAGE RELIEF.
5. STATION AND OFFSETS OF TEMPORARY RAILING (TYPE K) ARE LOCATED AT THE CENTER LINE OF THE RAILING.
6. TEMPORARY RAILING (TYPE K) SHALL BE PINNED PER STANDARD PLANS.
7. DRIVEWAY ACCESS SHALL BE MAINTAINED AT ALL TIMES.



NOT FOR CONSTRUCTION



BLAIRS LANE SECTION A-A



PG&E DRIVEWAY SECTION B-B

STAGE 2 NOTES

1. CONSTRUCT RETAINING WALL No. 3
2. CONSTRUCT SOUTHBOUND ROADWAY
3. CONSTRUCT Temp TRANSITION AFTER COMPLETION OF STAGE 2
4. CONSTRUCT NORTHERN PORTION OF PG&E DRIVEWAY
5. REMOVE REMAINING BRIDGE PORTION CONSTRUCT BRIDGE PORTION (SEE BRIDGE PLANS)

TRAFFIC HANDLING

1" = 20'

TH-2

CALCULATED/ DESIGNED BY	CHECKED BY	VFD	DATE 05/07	REVISED BY	DATE REVISED
		XX	XX/XX		
				MRR	4/12
				PSK	7/13

PROJECT ENGINEER: CAROLYN DAVIS

AGENCY NAME: CITY OF PLACERVILLE DEPARTMENT OF PUBLIC WORKS

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NOTES:

1. THIS PLAN ACCURATE FOR TRAFFIC HANDLING WORK ONLY.
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3. SEE CONSTRUCTION AREA SIGNS PLAN FOR ADDITIONAL CONSTRUCTION AREA SIGNS.
4. TEMPORARY RAILING (TYPE K) SHALL HAVE SCUPPERS TO ALLOW DRAINAGE RELIEF.
5. STATION AND OFFSETS OF TEMPORARY RAILING (TYPE K) ARE LOCATED AT THE CENTER LINE OF THE RAILING.
6. TEMPORARY RAILING (TYPE K) SHALL BE PINNED PER STANDARD PLANS.
7. DRIVEWAY ACCESS SHALL BE MAINTAINED AT ALL TIMES.
8. TEMPORARY RAILING (TYPE K) FOR BRIDGE CLOSURE AS DIRECTED BY ENGINEER.

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
03	ED	BLAIRS LN			

100% SUBMITTAL

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

C. Davis No. C58440 Exp. 12/31/16 CIVIL — REGISTERED PROFESSIONAL ENGINEER — STATE OF CALIFORNIA

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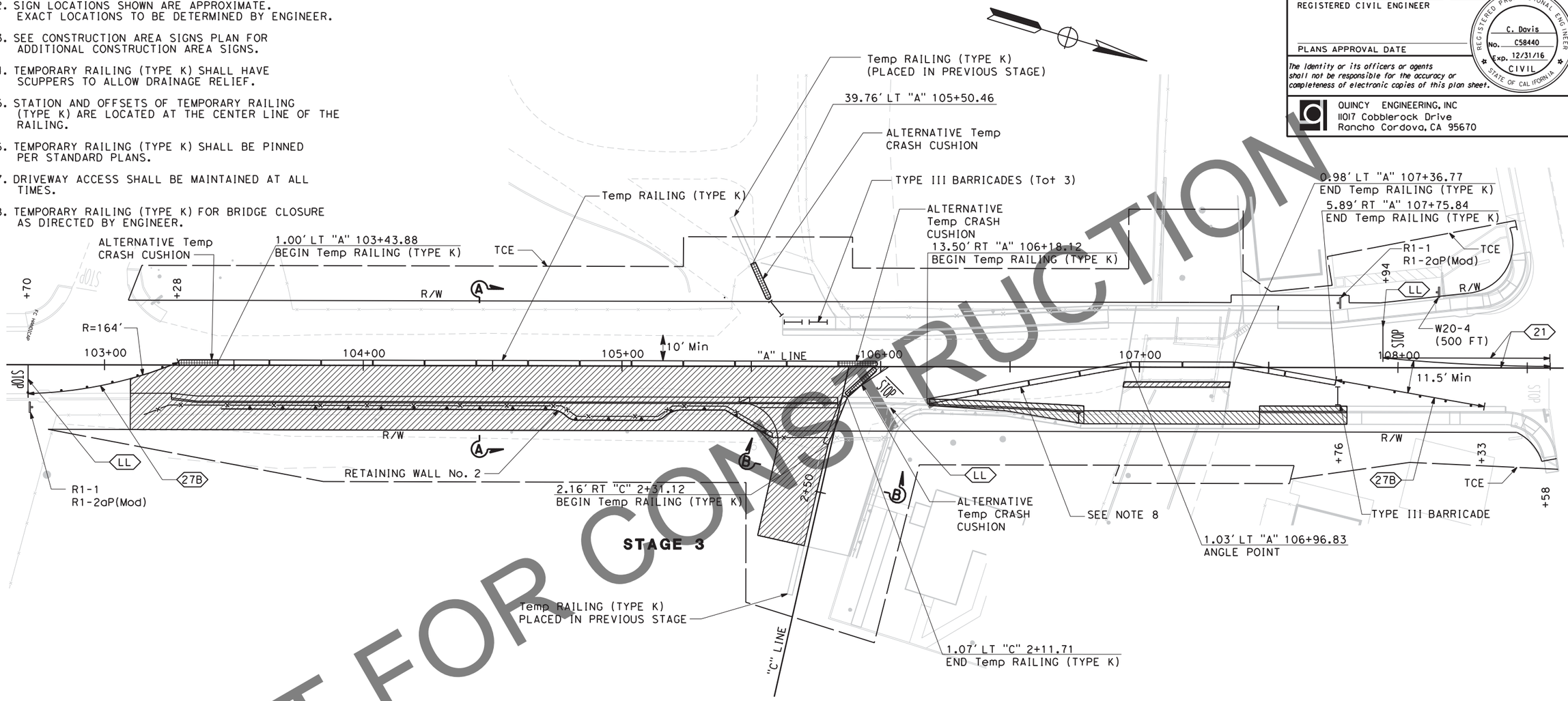
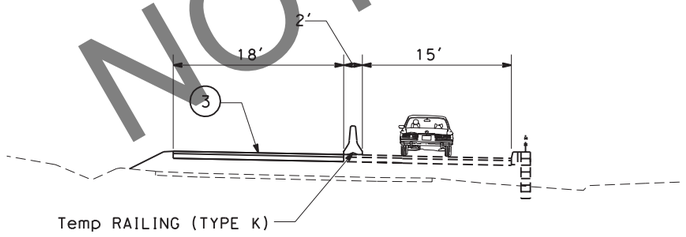
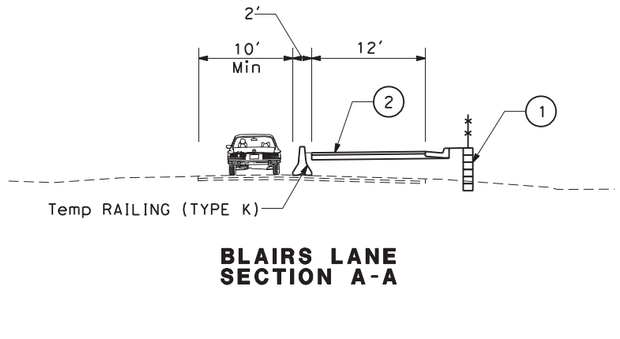
Rancho Cordova, CA 95670



NOT FOR CONSTRUCTION



CALTRANS DRIVEWAY SECTION B-B



BLAIRS LANE SECTION A-A

STAGE 3 NOTES

1. CONSTRUCT RETAINING WALL No. 2
2. CONSTRUCT NORTHBOUND ROADWAY
3. CONSTRUCT SOUTHERN PORTION OF CALTRANS DRIVEWAY

TRAFFIC HANDLING

1" = 20'

TH-3

CALCULATED/ DESIGNED BY	CHECKED BY	DATE	REVISED BY	DATE REVISED
VFD	XX	05/07	XX/0X	XX/XX/XX
MRR	PSK	4/12	7/13	

PROJECT ENGINEER: CAROLYN DAVIS

AGENCY NAME: CITY OF PLACERVILLE DEPARTMENT OF PUBLIC WORKS

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CU 00000 EA 000000

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
03	ED	BLAIRS LN			

100% SUBMITTAL

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — C. Davis — No. C58440 — Exp. 12/31/16 — CIVIL — STATE OF CALIFORNIA

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11017 Cobblerock Drive
Rancho Cordova, CA 95670

CALCULATED/ DESIGNED BY	VFD	DATE 05/07	REVISED BY	MRR	PSK
CHECKED BY	XX	XX/XX	DATE REVISED	4/12	7/13

PROJECT ENGINEER
CAROLYN DAVIS

AGENCY NAME
CITY OF PLACERVILLE DEPARTMENT OF PUBLIC WORKS

NOTES:

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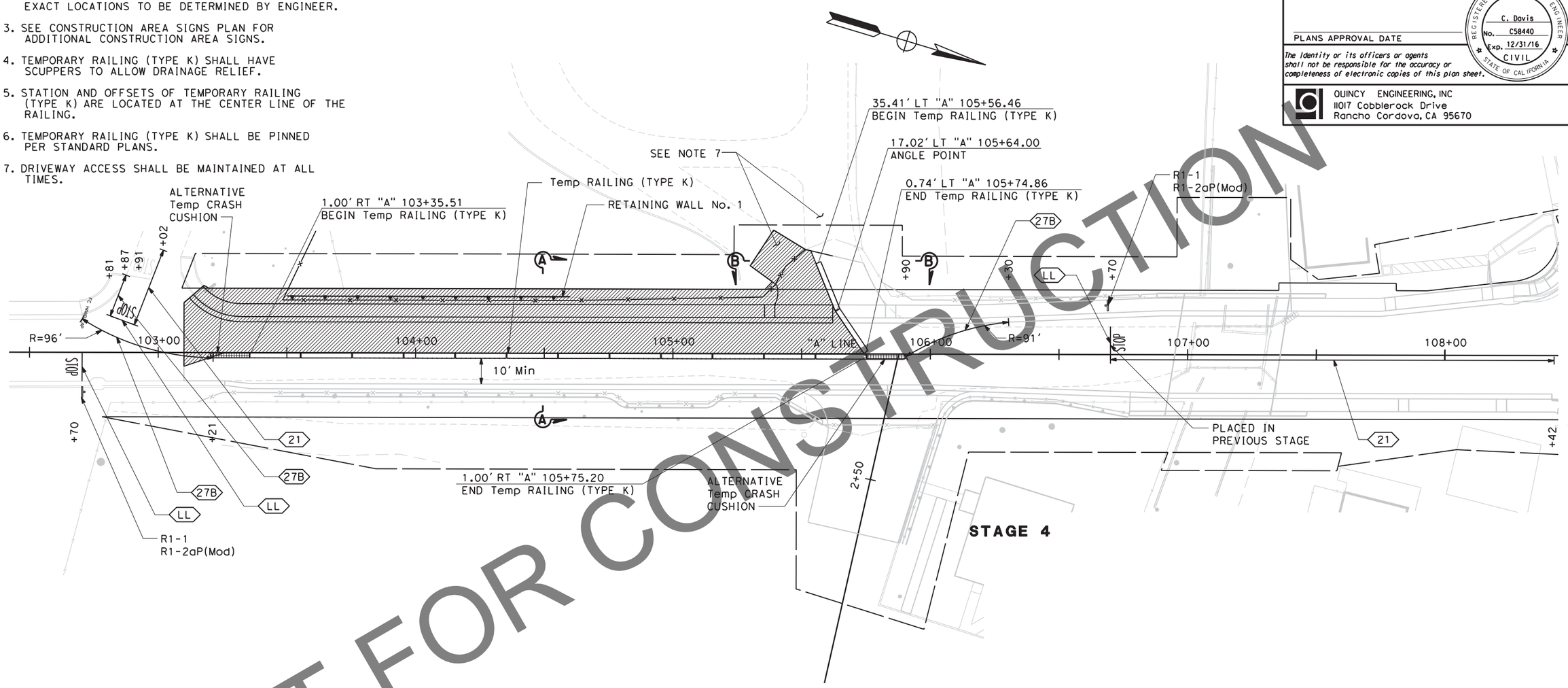
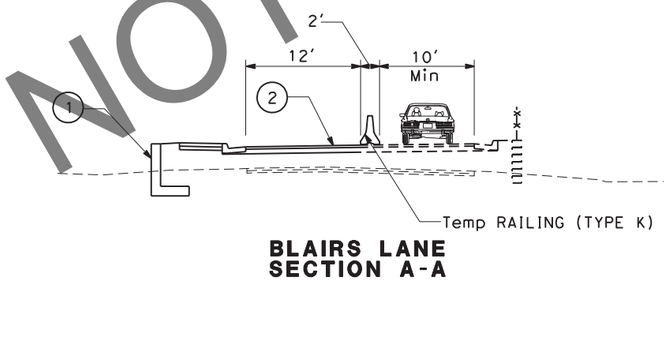
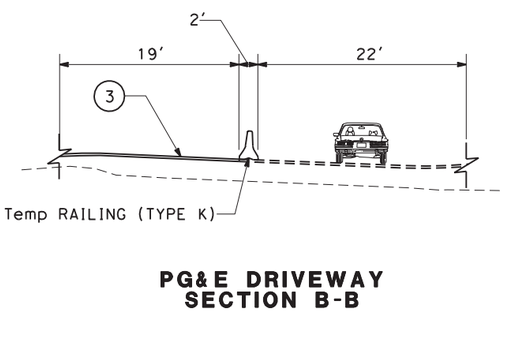
7. DRIVEWAY ACCESS SHALL BE MAINTAINED AT ALL TIMES.



NOT FOR CONSTRUCTION



BLAIRS LANE SECTION A-A



PG&E DRIVEWAY SECTION B-B

STAGE 4 NOTES

1. CONSTRUCT RETAINING WALL No. 1
2. CONSTRUCT SOUTHBOUND ROADWAY
3. CONSTRUCT SOUTHERN PORTION OF PG&E DRIVEWAY

TRAFFIC HANDLING

1" = 20'

TH-4

LAST REVISION 00-00-00 | DATE PLOTTED => 3/11/2015 | TIME PLOTTED => 4:30:37 PM

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CU 00000

EA 000000

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
03	ED	BLAIRS LN			

100% SUBMITTAL

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — C. Davis — No. C58440 — Exp. 12/31/16 — CIVIL — STATE OF CALIFORNIA

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QUINCY ENGINEERING, INC
11017 Cobblerock Drive
Rancho Cordova, CA 95670

	DATE	REVISED BY	MRR	PSK
CALCULATED/ DESIGNED BY	05/07	DATE REVISED	4/12	7/13
CHECKED BY	XX	XX/0X		

PROJECT ENGINEER
CAROLYN DAVIS

AGENCY NAME
CITY OF PLACERVILLE DEPARTMENT OF PUBLIC WORKS

TEMPORARY PAVEMENT DELINEATION

SHEET No.	STAGE	FROM		TO		TEMPORARY TRAFFIC STRIPE (PAINT)			TEMPORARY PAVEMENT MARKING (PAINT)	DESCRIPTION
						DETAIL No.	4" WHITE	4" YELLOW		
		LINE	STATION	LINE	STATION		LF	LF	SQFT	
TH-1	1	"A"	103+10.00	"A"	105+45.00	21		235.0	34.0	LIMIT LINE AND "STOP"
TH-1	1	"A"	107+94.00	"A"	108+59.00	21		130.0	34.0	LIMIT LINE AND "STOP"
TH-1	1	"A"	107+53.00	"A"	108+59.00	27B	121.0			
TH-2	2	"A"	107+69.00	"A"	108+54.00	27B	93.0			
TH-2	2	"A"	108+00.00	"A"	108+58.00	21		115.0	34.0	LIMIT LINE AND "STOP"
TH-2	2	"A"	105+25.00						34.0	LIMIT LINE AND "STOP"
TH-2	2	"A"	106+19.00	"A"	107+80.00	27B	162.7			
TH-3	3	"A"	102+70.00	"A"	103+28.00	27B	60.0		34.0	LIMIT LINE AND "STOP"
TH-3	3	"A"	106+09.00						32.0	LIMIT LINE AND "STOP"
TH-3	3	"A"	106+45.00						34.0	LIMIT LINE AND "STOP"
TH-3	3	"A"	107+21.00	"A"	107+50.00	27B	35.0			
TH-3	3	"A"	108+10.00	"A"	108+58.00	21		48.0	34.0	LIMIT LINE AND "STOP"
TH-3	3	"A"	107+76.00	"A"	108+33.00	27B	58.3			
TH-4	4	"A"	102+70.00						34.0	LIMIT LINE AND "STOP"
TH-4	4	"A"	102+70.00	"A"	103+21.00	27B	54.0			
TH-4	4	"A"	102+81.00	"A"	102+87.00	27B	17.0			
TH-4	4	"A"	102+97.00	"A"	103+09.00	21		31.5	32.0	LIMIT LINE AND "STOP"
TH-4	4	"A"	105+90.00	"A"	106+30.00	27B	42.5			
TH-4	4	"A"	106+70.00	"A"	108+42.00	21		345.0		
						SUBTOTAL	643.5	904.5	336.0	
						TOTAL	1548.0		336.0	

TRAFFIC CONTROL ITEMS

SHEET No.	STAGE	FROM			TO			TEMPORARY RAILING (TYPE K)	ALTERNATIVE TEMPORARY CRASH CUSHION	FLASHING BEACON (PORTABLE)	TYPE III BARRICADE	DESCRIPTION
		LINE	STATION	OFFSET	LINE	STATION	OFFSET	LF	EA	EA	EA	
TH-1	1	"C"	2+91.10	2.87' LT	"A"	107+38.58	19.49' RT	240	1	2	3	FLASHING BEACON MOUNTED ON K-RAIL
TH-2	2	"A"	105+47.05	53.18' LT	"A"	107+55.26	3.99' RT	260	1	2	8	FLASHING BEACON MOUNTED ON K-RAIL
TH-2	2	"C"	2+31.43	2.02' RT					1			
TH-3	3	"A"	105+54.60	34.69' LT					1			
TH-3	3	"A"	103+43.88	1.00' LT	"A"	107+43.58	1.00' LT	420	3		4	
TH-3	3	"A"	105+78.85	29.89' RT	"A"	106+03.54	1.07' RT	40				
TH-4	4	"A"	103+35.51	1.00' RT	"A"	105+74.86	0.74' LT	240	2			
TH-2	2	"C"	2+71.50								5	
TH-4	2	"A"	105+60.00								2	
							TOTAL	1,200	9	4	22	

NOT FOR CONSTRUCTION

TRAFFIC HANDLING QUANTITIES

THQ-1

LAST REVISION 00-00-00
DATE PLOTTED => 3/11/2015
TIME PLOTTED => 3:52:23 PM

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FILE => S:\Client\PLACERVI\p07-300\CAD\pl96r\Roadway Plans_V8 Files\pl96rmf001.dgn

CU 00000 EA 000000

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
03	ED	BLAIRS LN			

100% SUBMITTAL

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — C. Davis — No. C58440 — Exp. 12/31/16 — CIVIL — STATE OF CALIFORNIA

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QUINCY ENGINEERING, INC
11017 Cobblerock Drive
Rancho Cordova, CA 95670

CALCULATED/ DESIGNED BY	CHECKED BY	VFD	DATE 05/07	REVISED BY	DATE REVISED
		XX	XX/XX	MRR	4/12
				PSK	7/13

PROJECT ENGINEER
CAROLYN DAVIS

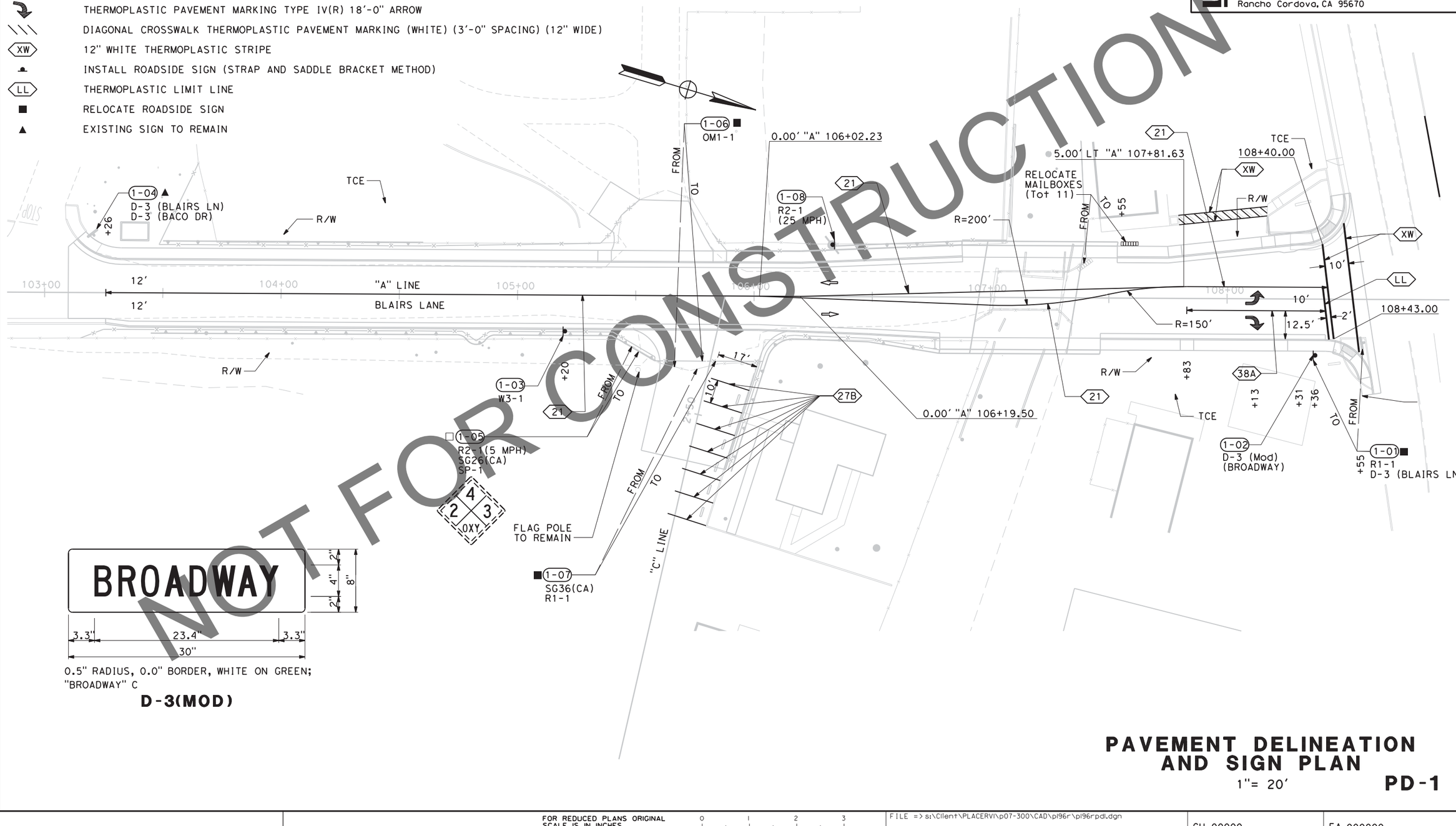
AGENCY NAME
CITY OF PLACERVILLE DEPARTMENT OF PUBLIC WORKS

LEGEND

- XX — PAVEMENT DELINEATION DETAIL No. (THERMOPLASTIC)
- (CA) — CALIFORNAIA SIGN CODE
- BEGIN/END TRAFFIC STRIPE DETAIL
- DIRECTION OF TRAFFIC FLOW
- EXISTING ROADSIDE SIGN
- XX — ROADSIDE SIGN (SHEET No. - SIGN No.)
- THERMOPLASTIC PAVEMENT MARKING TYPE IV(L) 18'-0" ARROW
- THERMOPLASTIC PAVEMENT MARKING TYPE IV(R) 18'-0" ARROW
- DIAGONAL CROSSWALK THERMOPLASTIC PAVEMENT MARKING (WHITE) (3'-0" SPACING) (12" WIDE)
- XW — 12" WHITE THERMOPLASTIC STRIPE
- INSTALL ROADSIDE SIGN (STRAP AND SADDLE BRACKET METHOD)
- LL — THERMOPLASTIC LIMIT LINE
- RELOCATE ROADSIDE SIGN
- EXISTING SIGN TO REMAIN

NOTES:

1. THIS PLAN ACCURATE FOR PAVEMENT DELINEATION AND SIGNS ONLY.
2. ALL PARKING SPACES ON CALTRANS DRIVEWAY TO HAVE THE SAME DIMESIONS.



NOT FOR CONSTRUCTION

0.5" RADIUS, 0.0" BORDER, WHITE ON GREEN;
"BROADWAY" C

D-3(MOD)

PAVEMENT DELINEATION AND SIGN PLAN

1"= 20'

PD-1

LAST REVISION	DATE PLOTTED => 3/11/2015
00-00-00	TIME PLOTTED => 3:56:55 PM

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EA 000000

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Rancho Cordova, CA 95670

NOT FOR CONSTRUCTION

PAVEMENT DELINEATION

SHEET No.	FROM			TO			THERMOPLASTIC TRAFFIC STRIPE				THERMOPLASTIC PAVEMENT MARKING	
	LINE	STATION	RT/LT	LINE	STATION	RT/LT	DETAIL No.	8" WHITE LF	4" WHITE LF	4" YELLOW LF	SQFT	DESCRIPTION
PD-1	"A"	103+26.00		"A"	108+36.00		21			1394.0		
PD-1	"A"	107+83.00	RT	"A"	108+36.00	RT	38A	59.0				
PD-1	"A"	108+13.00	RT	"A"							15.0	TYPE IV (L) ARROW
PD-1	"A"	108+13.00	RT	"A"							15.0	TYPE IV (R) ARROW
PD-1	"A"	108+36.00	RT	"A"							22.5	LIMIT LINE
PD-1	"A"	108+40.00									95.5	CROSSWALK
PD-1	"C"						27B		119.0			PARKING SPACE LINES
PD-1	"A"		LT								127.8	PASSAGE WAY CROSSWALK
							SUBTOTAL	59.0	119.0	1394.0	275.8	
							TOTAL	59.0	1513.0		275.8	

PAVEMENT DELINEATION AND SIGN QUANTITIES

PDQ-1

CALCULATED/ DESIGNED BY	VFD	DATE	REVISED BY	MRR	PSK
CHECKED BY	XX	XX/0X	DATE REVISED	4/12	7/13

PROJECT ENGINEER: CAROLYN DAVIS

AGENCY NAME: CITY OF PLACERVILLE DEPARTMENT OF PUBLIC WORKS

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CU 00000 EA 000000

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03	ED	BLAIRS LN			

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CALCULATED/ DESIGNED BY		VFD	05/07	REVISED BY	MRR	4/12	7/13	PSK			
CHECKED BY		XX	XX/0X	DATE REVISED							

PROJECT ENGINEER: CAROLYN DAVIS

AGENCY NAME: CITY OF PLACERVILLE DEPARTMENT OF PUBLIC WORKS

ROADSIDE SIGNS

SIGN No.	SIGN CODE		SIGN MESSAGE	PANEL SIZE	POST SIZE & LENGTH (N)	ROADSIDE SIGN-ONE POST	INSTALL SIGN (STRAP AND SADDLE BRACKET METHOD)	RELOCATE ROADSIDE SIGN	RELOCATE MAILBOX	DESCRIPTION
					4" x 4"					
	FEDERAL	CALIFORNIA		INCH x INCH	LF	EA	EA	EA	EA	
1-01	R1-1		STOP					1		
	D-3		BLAIRS LN						1	MOUNT ON TOP BROADWAY SIGN
1-02	D-3 (Mod)		BROADWAY	30 x 8	10.5	1				MOUNT ON TOP STOP SIGN
1-03	W3-1		STOP AHEAD SYMBOL	30 x 30	10.5	1				
1-04	D-3		BLAIRS LN							EXISTING SIGN TO REMAIN
	D-3		BACO DR							EXISTING SIGN TO REMAIN
1-05	R2-1		SPEED LIMIT 5 MPH					1		MOUNT NEXT TO CALTRANS SIGN
		SG26 (CA)	STATE OF CALIFORNIA CT CALTRANS PLACERVILLE MAINTENANCE STATION					1		MOUNT BETWEEN 5 MPH SIGN AND HAZMAT DIAMOND
	SP-1		HAZMAT DIAMOND 2,4,3, OXY					1		MOUNT NEXT TO CALTRANS SIGN
1-06	OM1-1		YELLOW DIAMOND					1		
1-07		SG36 (CA)	BUCKLE UP WITH SYMBOL					1		MOUNT NEXT TO STOP SIGN
	R1-1		STOP					1		MOUNT NEXT TO BUCKLE UP SIGN
1-08	R2-1		SPEED LIMIT 25	24 x 30	10.5		1			ATTACH SIGN TO UTILITY POLE
									11	MAILBOXES ON ONE-POST
			SUBTOTAL CS-1			10				CONSTRUCTION AREA SIGNS (STATIIONARY MOUNTED)
			TOTAL			12	1	8	11	

(N) NOT A SEPARATE PAY ITEM, FOR INFORMATION ONLY.

SIGN PANEL ITEMS

No. OF SIGNS	SIGN CODE		PANEL SIZE (L x D)	SIGN AREA	SINGLE FACED	BACKGROUND		LEGEND		PROTECTIVE OVERLAY	FURNISH SINGLE SHEET ALUMINUM (UNFRAMED SIGN)	DESCRIPTION (REMARKS)
						SHEETING COLOR	RETROREFLECTIVE ASTM TYPE	SHEETING COLOR	RETROREFLECTIVE ASTM TYPE		0.063"	
	FEDERAL	CALIFORNIA	INCH x INCH	SQFT							SQFT	
1	D-3 (Mod)		30 x 8	1.7	X	GREEN	IX	WHITE	IX	X	1.7	BROADWAY
1	W3-1		30 x 30	6.3	X	YELLOW	IX	BLACK		X	6.3	STOP AHEAD SYMBOL
								RED	III			
3	G20-2		36 x 18	4.5	X	ORANGE	III	BLACK			13.5	END ROAD WORK
3	W20-1		36 x 36	9.0	X	ORANGE	III	BLACK			27.0	ROAD WORK AHEAD
2		C17 (CA)	24 x 24	4.0	X	WHITE	III	BLACK			8.0	ROAD WORK SPEED LIMIT 20 MPH
2	W5-3		36 x 36	9.0	X	WHITE	III	BLACK			18.0	ONE LANE BRIDGE
1	R2-1		24 x 30	5.0	X	WHITE	III	BLACK		X	5.0	SPEED LIMIT 25
										TOTAL	79.4	

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PAVEMENT DELINEATION AND SIGN QUANTITIES

PDQ-2

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CU 00000 EA 000000

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
03	ED	BLAIRS LN			

100% SUBMITTAL

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — C. Davis — No. C58440 — Exp. 12/31/16 — CIVIL — STATE OF CALIFORNIA

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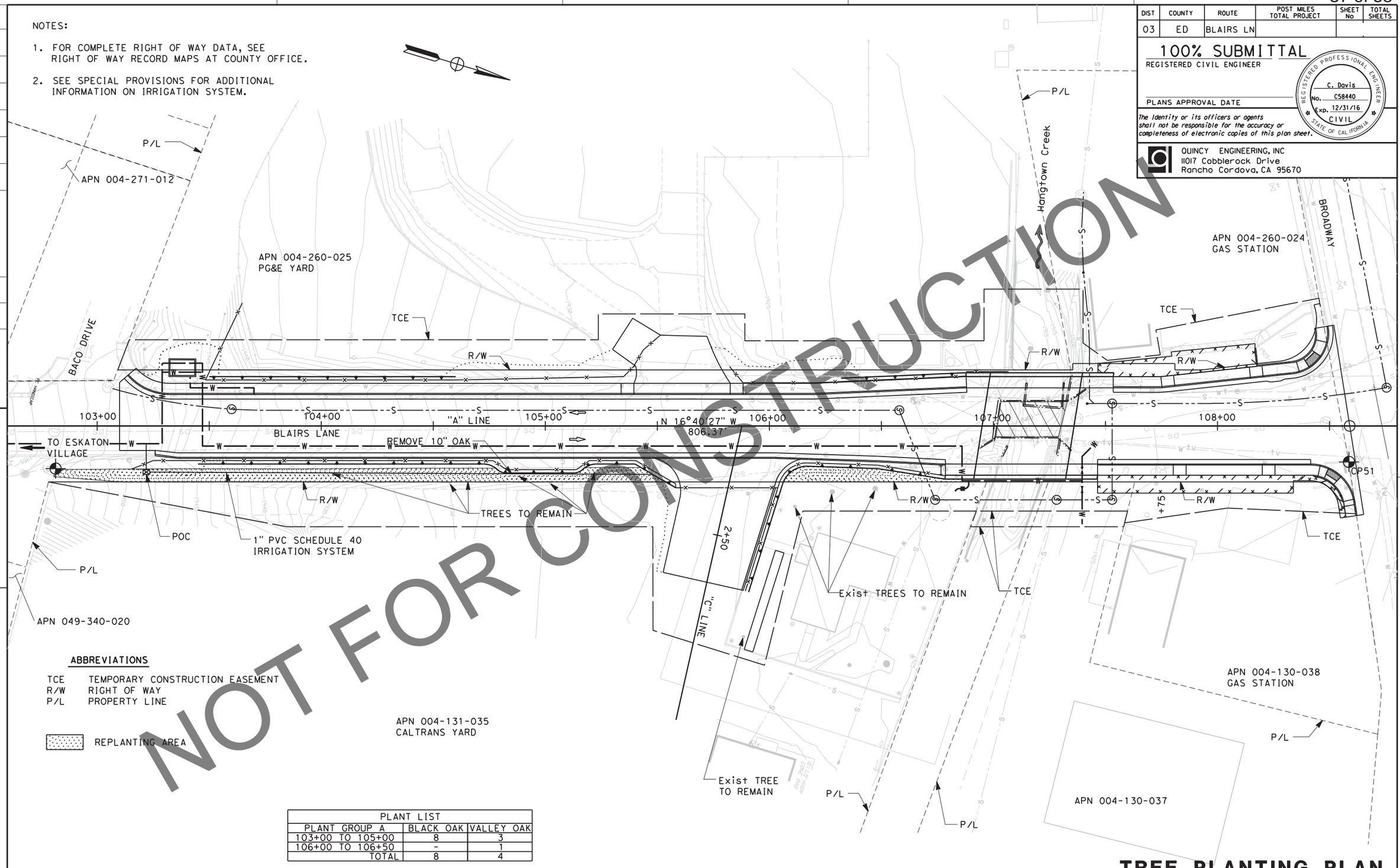
		XX	XX/XX		
				MRR	4/12
				PSK	7/13

PROJECT ENGINEER: CAROLYN DAVIS

AGENCY NAME: CITY OF PLACERVILLE DEPARTMENT OF PUBLIC WORKS

NOTES:

1. FOR COMPLETE RIGHT OF WAY DATA, SEE RIGHT OF WAY RECORD MAPS AT COUNTY OFFICE.
2. SEE SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION ON IRRIGATION SYSTEM.



ABBREVIATIONS

TCE	TEMPORARY CONSTRUCTION EASEMENT
R/W	RIGHT OF WAY
P/L	PROPERTY LINE

REPLANTING AREA

PLANT LIST		
PLANT GROUP A	BLACK OAK	VALLEY OAK
103+00 TO 105+00	8	3
106+00 TO 106+50	-	1
TOTAL	8	4

NOT FOR CONSTRUCTION

TREE PLANTING PLAN

1" = 20'

CT-1

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03	ED	BLAIRS LN			

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CHECKED BY		XX	XX/0X	DATE REVISED	4/12
					PSK 7/13

PROJECT ENGINEER: CAROLYN DAVIS

AGENCY NAME: CITY OF PLACERVILLE DEPARTMENT OF PUBLIC WORKS

ROADWAY ITEMS

SHEET No.	FROM		TO		IMPORTED BORROW	ROADWAY EXCAVATION	EMBANKMENT (N)	DITCH EXCAVATION	TACK COAT	CLASS 2 AGGREGATE BASE	HOT MIX ASPHALT (TYPE B)	PLACE HOT MIX ASPHALT (MISCELLANEOUS AREA)	COLD PLANE ASPHALT CONCRETE PAVEMENT	ANTI-GRAFFITI COATING
	LINE	STATION	LINE	STATION	CY	CY	CY	CY	TON	CY	TON	SQYD	SQYD	SQFT
L-1	"A"	103+10.00	"A"	108+59.05	537.6	208.4	746.0	1.3	2.8	671.0	428.4			1700.0
CD-1	"A"	107+46.52	"A"	108+54.87								86.0	86.0	
CD-1	"A"	107+46.69	"A"	108+16.80								70.3	70.3	
SW-2	BROADWAY	10+28.95	BROADWAY	15+69.77						181.7	123.5			
SUBTOTAL CLASS 2 AGGREGATE BASE (FROM DQ-1)										2.9				
SUBTOTAL CLASS 2 AGGREGATE BASE (FROM Q-2)										123.6				
SUBTOTAL CLASS 2 AGGREGATE BASE (FROM RETAINING WALL No.1)										96.0				
SUBTOTAL CLASS 2 AGGREGATE BASE (FROM RETAINING WALL No.3)										52.0				
TOTAL					537.6	208.4	746.0	1.3	2.8	1127.2	551.9	156.3	156.3	1700.0

(N) NOT A SEPARATE PAY ITEM, FOR INFORMATION ONLY.

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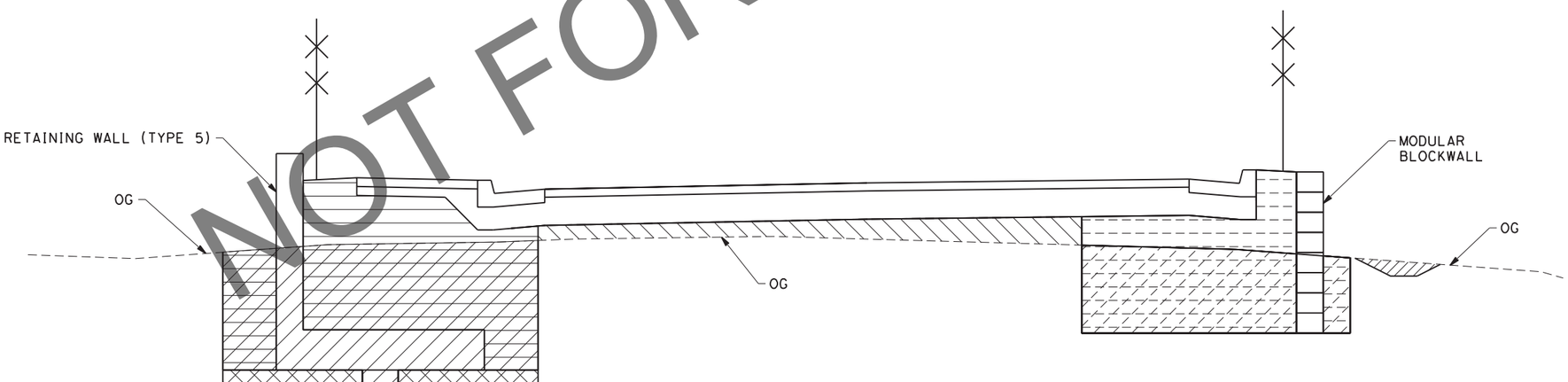

EARTHWORK PAYMENT LIMITS
NO SCALE

LEGEND:

- STRUCTURE BACKFILL (RETAINING WALL)
- STRUCTURE EXCAVATION (RETAINING WALL)
- STRUCTURE BACKFILL (MODULAR BLOCK WALL)
- STRUCTURE EXCAVATION (MODULAR BLOCK WALL)
- ROADWAY EMBANKMENT (IMPORT BORROW)
- OVER EXCAVATION (RETAINING WALL)
- DITCH EXCAVATION

SUMMARY OF QUANTITIES

Q-1

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Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
03	ED	BLAIRS LN			

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CHAIN LINK ITEMS

SHEET No.	FROM		TO		SUBSTATION FENCE	CHAIN LINK FENCE (TYPE CL-6)	CHAIN LINK FENCE (TYPE CL-3)	RELOCATE GATE	RESET GATE	22' CHAIN LINK GATE (TYPE CL-6)	24' CHAIN LINK GATE (TYPE CL-6)	REMOVE FENCE
	LINE	STATION	LINE	STATION	LF	LF	LF	EA	EA	EA	EA	LF
L-1	"A"	103+64.75	"A"	105+39.52	231.2							
L-1	"A"	105+81.17	"A"	106+32.02	52.7							
L-1	"A"	103+15.26	"A"	104+79.61		165.1						
L-1	"A"	104+85.61	"A"	105+58.17		77.1						
L-1	"A"	105+58.17								1		
L-1	"A"	106+03.81									1	
L-1	"A"	106+03.81	"C"	2+71.64			48.4					
L-1	"A"	106+03.81	"A"	106+78.57		80.4						
L-1	"A"	105+42.42		105+39.52				1				
L-1	"A"	105+51.38							1			
L-1	"A"	103+64.75	"A"	105+42.42								207.0
L-1	"A"	103+15.26	"A"	105+58.17								249.0
L-1	"A"	105+81.17	"A"	107+06.62								129.0
L-1	"A"	105+84.73	"A"	106+96.94								128.0
				TOTAL	283.9	322.5	48.4	1	1	1	1	713.0

MISC. ITEMS

SHEET No.	UTILITY BOX (N)	ADJUSTUTILITY COVER TO GRADE	ADJUST WATER VALVE COVER TO GRADE	REMOVE LIGHT POLE	RESET LIGHT POLE & RELOCATE ELECTRICAL BOX
	EA	EA	EA	EA	EA
UT-1	1	4	3	3	1
TOTAL	1	4	3	3	1

(N) NOT A SEPARATE PAY ITEM, FOR INFORMATION ONLY.

GUARD RAIL ITEMS

SHEET No.	FROM			TO			REMOVE GUARDRAIL	PEDESTRIAN BARRICADE
	LINE	STATION	OFFSET	LINE	STATION	OFFSET	LF	EA
L-1	"A"	107+40.34	16.58' LT	"A"	107+40.00	23.75' LT	7.5	
L-1	"A"	106+78.57	22.27' LT					1
							TOTAL 7.5	1

SUMMARY OF QUANTITIES

Q-2

PROJECT ENGINEER: CAROLYN DAVIS

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	CHECKED BY	XX/0X	DATE REVISED
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MRR		4/12	

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Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
03	ED	BLAIRS LN			

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PLANS APPROVAL DATE

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PROJECT ENGINEER: CAROLYN DAVIS

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MINOR CONCRETE

SHEET No.	FROM			TO			CLASS 2 AGGREGATE BASE*	MINOR CONCRETE (CURB)	MINOR CONCRETE (CURB AND GUTTER)	MINOR CONCRETE (SIDEWALK)	MINOR CONCRETE (CURB, GUTTER, AND SIDEWALK)	MINOR CONCRETE (CURB RAMP)	MINOR CONCRETE (DRIVEWAY)	PARKING BUMPER (PRECAST CONCRETE)	REMOVE CONCRETE CURB	REMOVE CONCRETE SIDEWALK	REMOVE CONCRETE (CURB, GUTTER AND SIDEWALK)	COMMENTS
	LINE	STATION	OFFSET	LINE	STATION	OFFSET	CY	LF	CY	CY	CY	CY	CY	EA	LF	LF	LF	
L-1	"A"	103+12.08	21.21' LT	"A"	105+33.86	12.00' LT	35.8				24.7							ATTACHED SIDEWALK
L-1	"A"	105+88.26	12.00' LT	"A"	106+88.12	15.00' LT	16.1				11.1							ATTACHED SIDEWALK
L-1	"A"	107+53.48	15.00' LT	"A"	107+75.11	15.00' LT	3.5				2.4							ATTACHED SIDEWALK
L-1	"A"	108+20.62	19.88' LT	"A"	108+37.24	22.03' LT	2.6				1.8							ATTACHED SIDEWALK
L-1	"A"	108+51.08	36.77' LT	"A"	108+51.32	44.89' LT	1.3				0.9							ATTACHED SIDEWALK
L-1	"A"	107+46.52	15.00' RT	"A"	107+80.30	15.00' RT	5.4				3.8							ATTACHED SIDEWALK
L-1	"A"	108+25.70	15.00' RT	"A"	108+41.62	15.00' RT	2.6				1.8							ATTACHED SIDEWALK
CD-1	"A"	108+41.62	16.88' RT	"A"	108+45.97	17.35' RT	0.2			0.2								ATTACHED SIDEWALK
CD-1	"A"	108+61.27	32.67' RT	"A"	108+62.41	39.97' RT	0.4			0.4								ATTACHED SIDEWALK
CD-1	"A"	108+36.69	23.82' LT	"A"	108+49.25	37.20' LT	2.4					1.9						CURB RAMP (CASE C)
CD-1	"A"	108+45.97	17.35' RT	"A"	108+61.27	32.67' RT	2.9					2.3						CURB RAMP (CASE C)
CD-1	"A"	108+16.71	34.43' LT	"A"	108+43.89	43.61' LT		44.7										CURB (TYPE A3-6)
CD-1	"A"	108+41.62	16.88' RT	"A"	108+62.41	39.97' RT		34.5										CURB (TYPE A1-6)
CD-2	"A"	105+33.86	12.00' LT	"A"	105+88.26	12.00' LT	8.0						7.9					PG&E DRIVEWAY
CD-2	"A"	105+44.24	12.00' RT	"A"	106+18.92	12.56' RT	6.0						3.8					CALTRANS DRIVEWAY
CD-2	"A"	107+75.11	15.00' LT	"A"	108+20.62	19.88' LT	6.1						8.9					COMMERCIAL DRIVEWAY
CD-2	"A"	107+80.30	15.00' RT	"A"	108+25.70	15.00' RT	6.1						8.9					COMMERCIAL DRIVEWAY
L-1	"A"	103+25.87	10.94' RT	"A"	105+44.24	12.00' RT	17.2		12.3									
L-1	"A"	106+18.92	12.56' RT	"A"	106+78.62	15.00' RT	4.7		3.4									
L-1	"C"	2+97.14	22.78' LT	"C"	2+50.91	26.72' LT	2.3			2.3								DETACHED SIDEWALK
CD-2	"C"	2+71.50	15.93' LT	"C"	2+23.79	20.00' LT		47.9										CURB (TYPE A1-8)
L-1	"A"	103+17.28	25.72' LT	"A"	103+24.12	20.64' LT									10.0	10.0		
L-1	"C"	2+93.16		"C"	2+39.36									6				CONCRETE WHEEL STOP
CD-1	"C"	2+71.50	15.93' LT	"C"	2+30.20	19.04' LT									41.5			
CD-1	"A"	108+41.62	16.88' RT	"A"	108+62.41	39.97' RT									61.4			REMOVE ENITRE CURB
CD-1	"A"	108+16.71	34.43' LT	"A"	108+43.89	43.61' LT									48.5			
CD-1	"A"	108+26.66	22.81' LT	"A"	108+49.47	44.57' LT											38.6	
						TOTAL	123.6	127.0	15.7	2.9	46.5	4.2	29.5	6	161.4	10.0	38.6	

* FOR TOTAL QUANTITY, SEE "ROADWAY ITEMS" QUANTITY TABLE.

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SUMMARY OF QUANTITIES

Q-3

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03	ED	BLAIRS LANE			

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REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

Maxwell L. Katt No. C74940 Exp. 12/31/15 CIVIL — REGISTERED PROFESSIONAL ENGINEER — STATE OF CALIFORNIA

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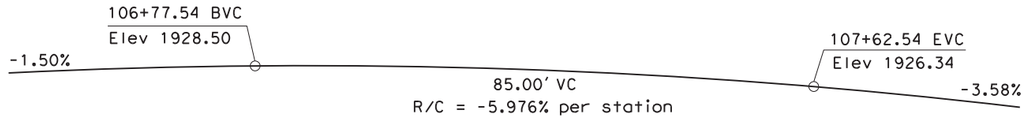
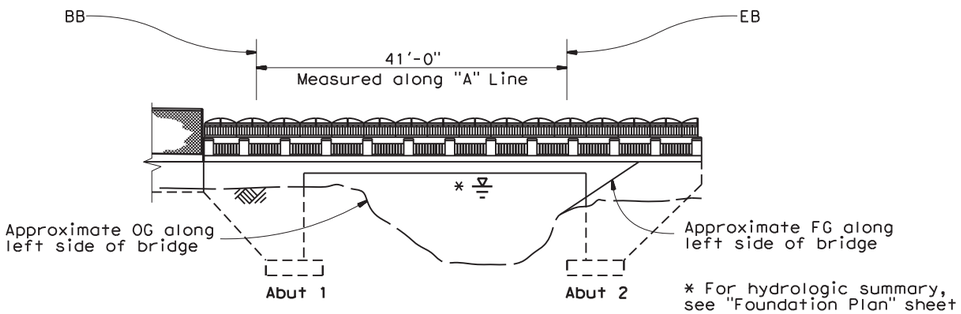
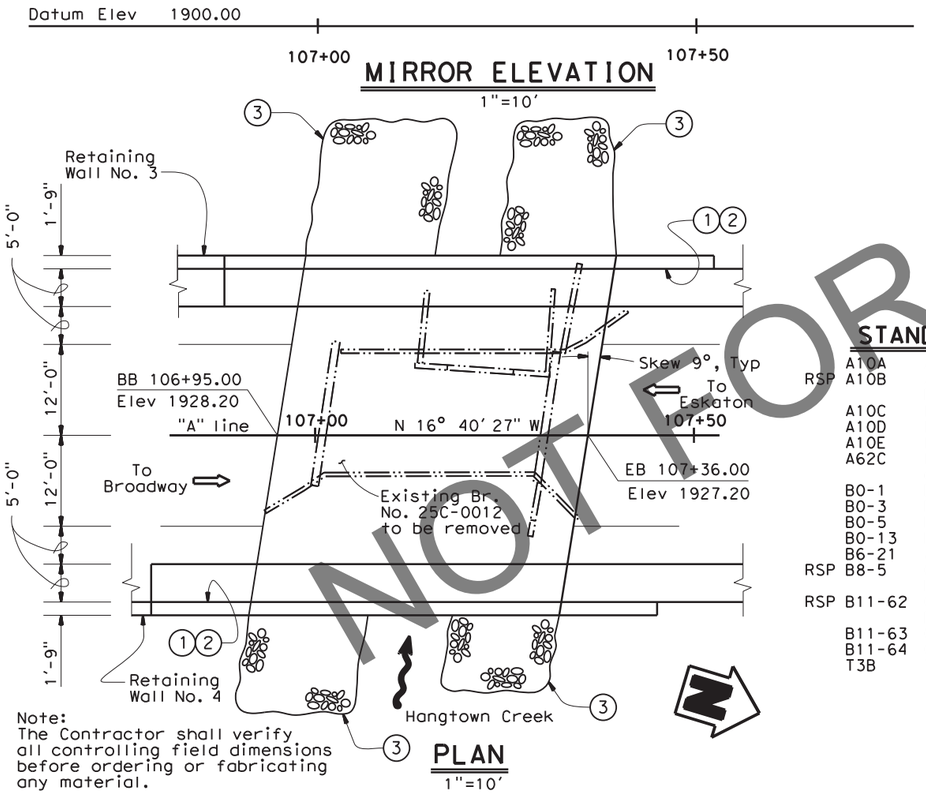


PROFILE GRADE
NO SCALE

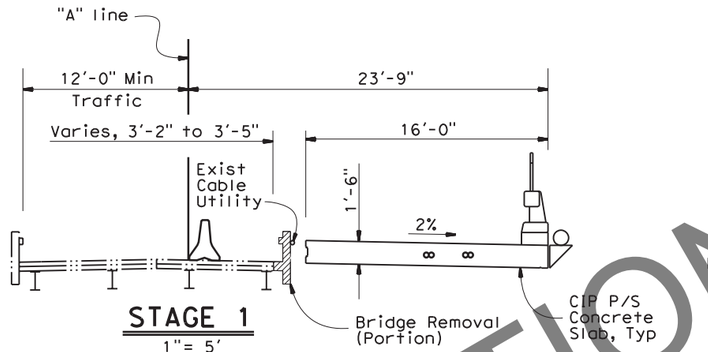




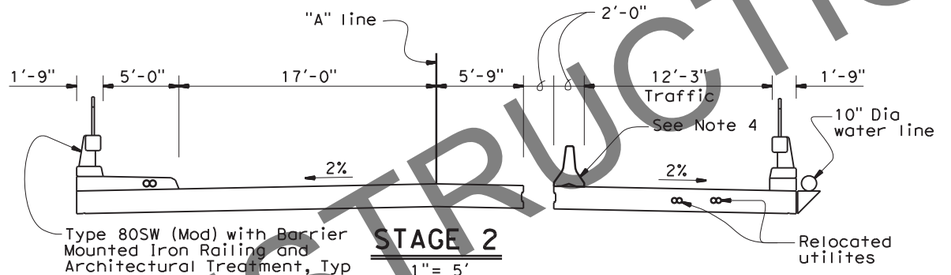
MIRROR ELEVATION
1"=10'

PLAN
1"=10'

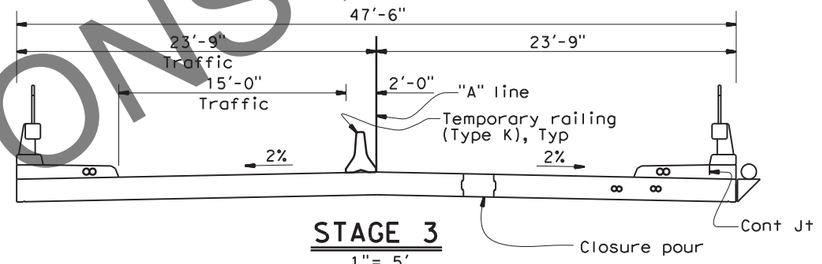
Note:
The Contractor shall verify all controlling field dimensions before ordering or fabricating any material.



STAGE 1
1"= 5'



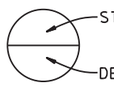
STAGE 2
1"= 5'



STAGE 3
1"= 5'

STANDARD PLANS DATED MAY 2010

	A10A	Abbreviations (Sheet 1 of 2)
RSP	A10B	Abbreviations (Sheet 2 of 2) Dated July 2013
	A10C	Lines and Symbols (1 of 3)
	A10D	Lines and Symbols (2 of 3)
	A10E	Lines and Symbols (3 of 3)
	A62C	Limits of Payment for Excavation and Backfill- Bridge
	B0-1	Bridge Details
	B0-3	Bridge Details
	B0-5	Bridge Details
	B0-13	Bridge Details
	B6-21	Joint Seals (Maximum Movement Rating = 2")
RSP	B8-5	Cast-in-Place Prestressed Girder Details Dated July 2013
RSP	B11-62	Concrete Barrier Type 80SW (Sheet 1 of 3) Dated November 2013
	B11-63	Concrete Barrier Type 80SW (Sheet 2 of 3)
	B11-64	Concrete Barrier Type 80SW (Sheet 3 of 3)
	T3B	Temporary Railing (Type K)



QUANTITIES

Bridge Removal	LS	
Structure Excavation (Bridge)	442	CY
Structure Backfill (Bridge)	315	CY
Structural Concrete (Bridge)	247	CY
Structural Concrete, Bridge Footing	68	CY
Drill and Bond Dowel	47	LF
Bar Reinforcing Steel (Bridge)	15711	LBS
Bar Reinforcing Steel (Epoxy Coated)(Bridge)	19977	LBS
Pre-stressing Cast-in-place Concrete		LS
Miscellaneous Metal (Bridge)	494	LBS
Concrete Barrier, Type 80SW (Mod)	130	LF
Architectural Treatment	1090	SY
Barrier Mounted Iron Railing	130	LF
Joint Seal (Type A)	48	LF
Asphalt Membrane Waterproofing	71	SF

Notes:

1. Stage 1: Contractor to divert traffic to left side of existing bridge, remove right side of existing bridge, and construct right side of new bridge including portion of Type 80SW (Mod) Barrier without sidewalk.
2. Stage 2: Contractor to divert traffic to right side of new bridge, remove remaining existing bridge, and construct left side of new bridge and Type 80SW (Mod) Barrier.
3. Stage 3: Contractor to divert traffic to left side of new bridge and construct closure pour and remaining portion of Type 80SW (Mod) Barrier.
4. Attach Temporary Railing to bridge deck and wingwall (see Road Plans).

Legend:

- (1) Paint "Br No. 25C-0012"
- (2) Paint "Hangtown Creek Bridge"
- (3) Rock Slope Protection, see Road Plans
- Bridge Removal (Portion)
- Existing structure
- * Highwater Elevation

INDEX TO PLANS

Sheet No.	Title
1	General Plan
2	Deck Contours
3	Foundation Plan
4	Abutment 1 Layout
5	Abutment 2 Layout
6	Abutment Details
7	Typical Section
8	Miscellaneous Details
9	Barrier Details
10	Iron Railing Details
11	Retaining Wall No. 1 General Plan
12	Retaining Wall No. 2 General Plan
13	Retaining Walls No. 2 & 4 Details No. 1
14	Retaining Walls No. 2 & 4 Details No. 2
15	Retaining Wall No. 3 General Plan
16	Retaining Wall No. 4 General Plan
17	Log of Test Borings

NOT FOR CONSTRUCTION

DESIGN	BY J. Quincy	CHECKED M. Katt	LOAD AND RESISTANCE FACTOR DESIGN	LIVE LOADING: HL93 WITH "LOW BOY" AND PERMIT DESIGN LOAD		PREPARED FOR THE CITY OF PLACERVILLE DEPARTMENT OF TRANSPORTATION	Maxwell Katt PROJECT ENGINEER
DETAILS	BY M. Katt	CHECKED J. Quincy	LAYOUT	BY M. Katt	CHECKED J. Quincy		
QUANTITIES	BY L. Mason/R. Kotey	CHECKED M. Ruble/M. Katt	SPECIFICATIONS	BY K. Gallagher	PLANS AND SPECS COMPARED		

BRIDGE NO. 25C-0012 | POST MILES

HANGTOWN CREEK BRIDGE
GENERAL PLAN

DESIGN GENERAL PLAN SHEET (ENGLISH) (REV.5/9/00)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU EA

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY): 3/1/2008

SHEET 1 OF 17

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DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
03	ED	BLAIRS LANE			

100% SUBMITTAL

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Maxwell L. Katt — No. C74940 — Exp. 12/30/15 — CIVIL — STATE OF CALIFORNIA

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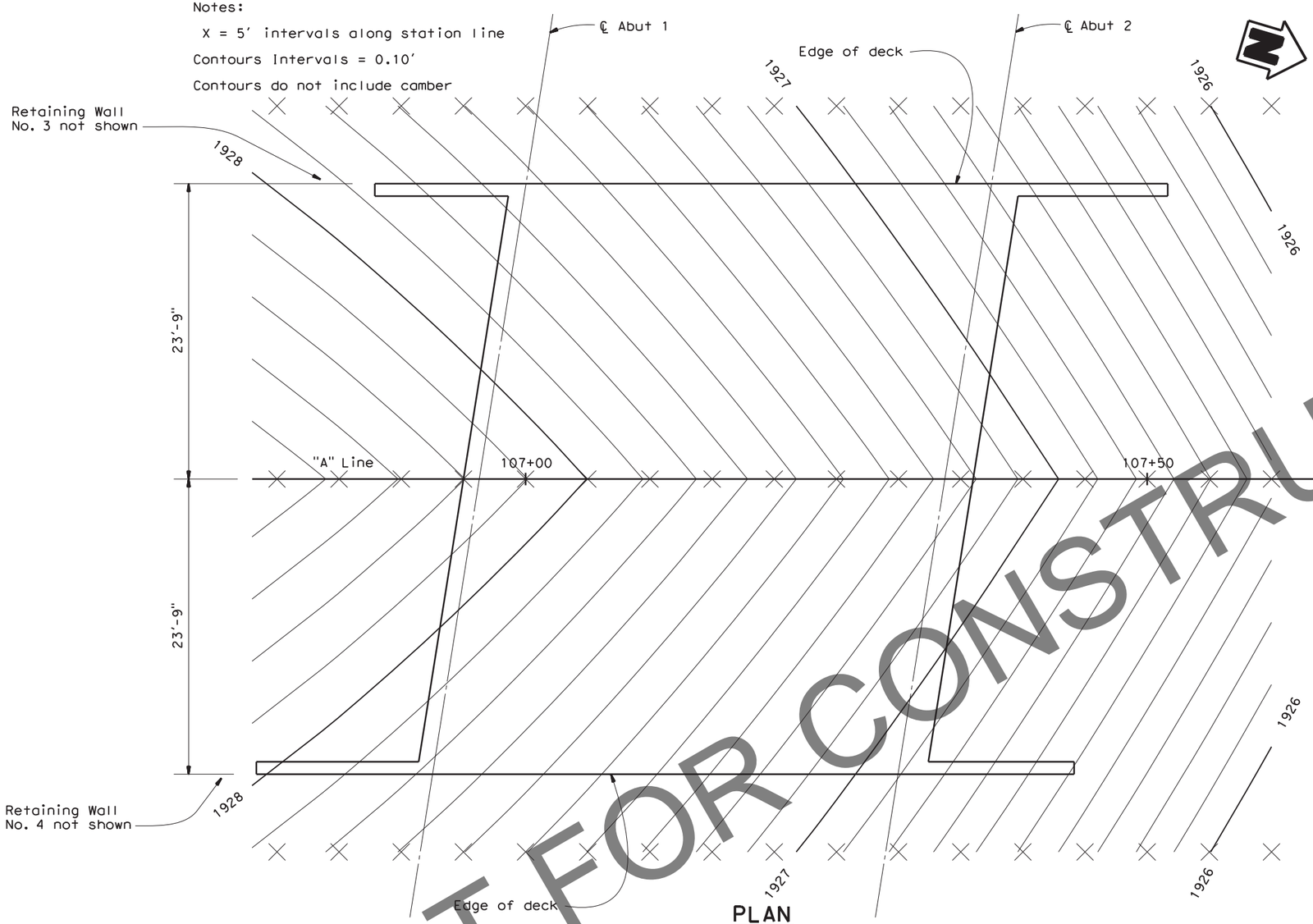
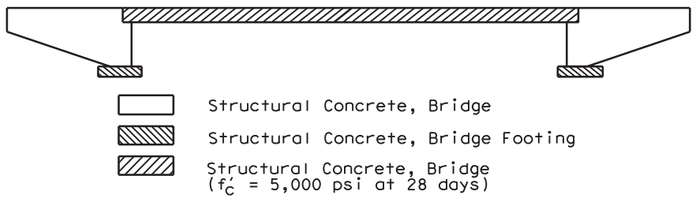
Rancho Cordova, CA 95670

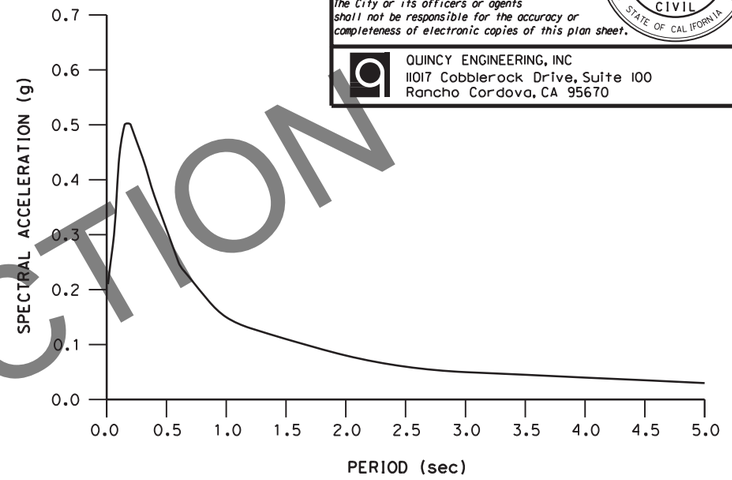
Notes:
X = 5' intervals along station line
Contours Intervals = 0.10'
Contours do not include camber



PLAN
1"= 5'



CONCRETE STRENGTH AND TYPE LIMITS
No Scale



ACCELERATION RESPONSE SPECTRA CURVE

GENERAL NOTES
LOAD AND RESISTANCE FACTOR DESIGN

DESIGN:	AASHTO LRFD Bridge Design Specifications 6th Edition and the Caltrans Amendments; except that Standard Bridge Details XS sheets are designed using Bridge Design Specifications (1996 AASHTO w/Revisions by Caltrans)
SEISMIC DESIGN:	Caltrans Seismic Design Criteria (SDC), Version 1.7 dated April 2013
DEAD LOADING:	Includes 35 psf for future wearing surface
LIVE LOADING:	HL93 with "Low-boy" and Permit design vehicle
SEISMIC LOADING:	SDC ARS Curve with V_{S30} = 560 m/s Maximum Magnitude 7.0 Peak Horizontal ground Acceleration = 0.21 g
REINFORCED CONCRETE:	f_y = 60 ksi f'_c = 3.6 ksi, unless otherwise noted n = 9
PRESTRESSED CONCRETE:	See Prestressing Notes on "Typical Section" sheet
FOOTING PRESSURE:	See Foundation Plan

Note:
The Contractor shall verify all controlling field dimensions before ordering or fabricating any material.

NOT FOR CONSTRUCTION

DESIGN	BY J. Quincy	CHECKED M. Katt	PREPARED FOR THE CITY OF PLACERVILLE DEPARTMENT OF TRANSPORTATION	Maxwell Katt PROJECT ENGINEER	BRIDGE NO. 25C-0012
DETAILS	BY M. Katt	CHECKED J. Quincy			POST MILE
QUANTITIES	BY L. Mason/R. Kotey	CHECKED M. Ruble/M. Katt			

HANGTOWN CREEK BRIDGE
DECK CONTOURS

STRUCTURES DESIGN DETAIL SHEET (ENGLISH) (REV. 9/2/98)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU
EA

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SHEET 2 OF 17

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DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL
03	ED	BLAIRS LANE			

100% SUBMITTAL

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Maxwell L. Katt — No. C74940 — Exp. 12/30/15 — CIVIL — STATE OF CALIFORNIA

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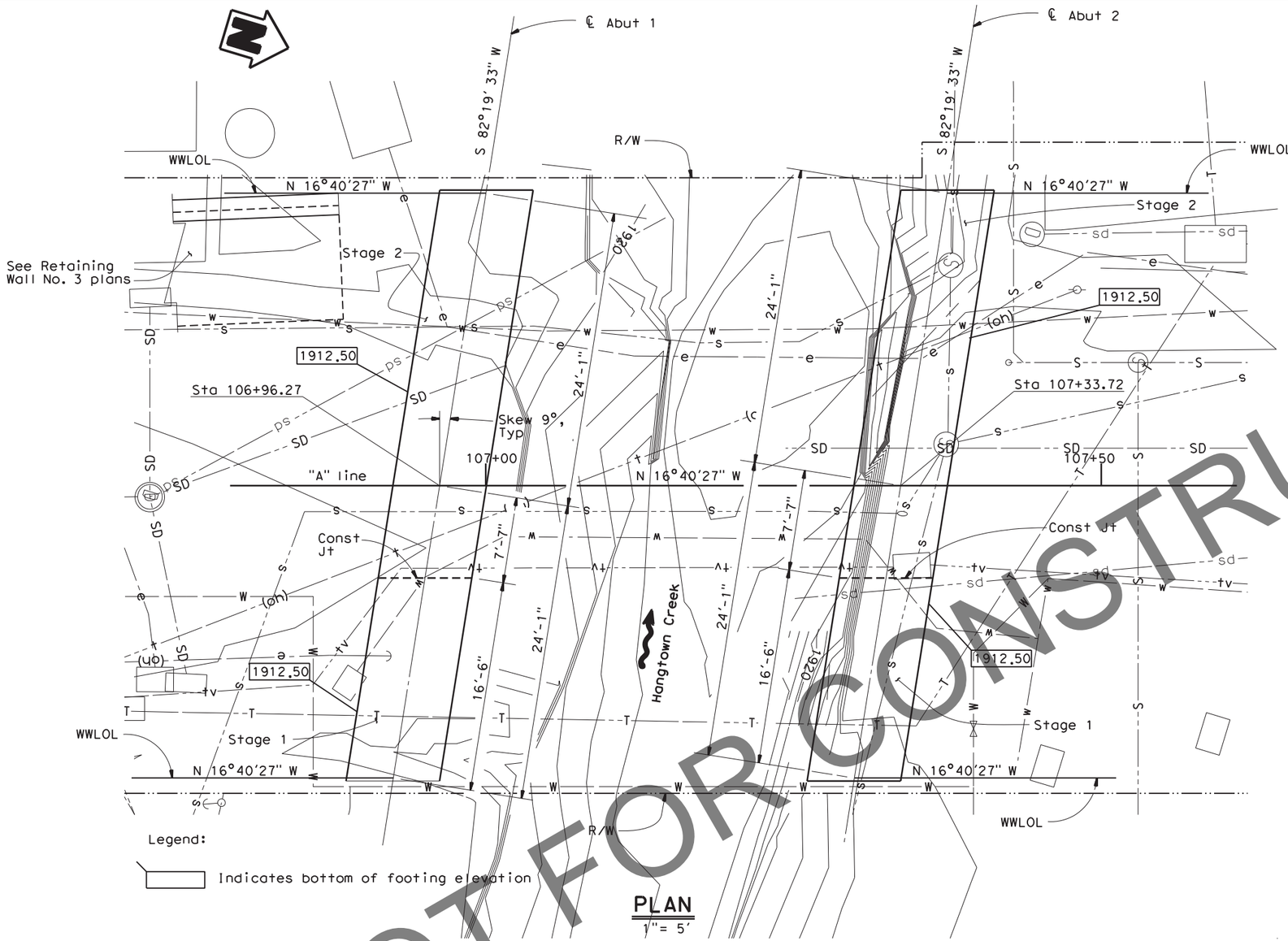

PLAN
1"= 5'

Notes:

1. Utility locations shown are approximate. For utility plans, see Road Plans.
2. For Temporary Construction Easement Limits, see Roadway "Layout" sheets.

HYDROLOGIC SUMMARY

Drainage area: 2.6 Square Miles

	Design Flood	Base Flood	Overtopping Flood
Frequency (years)	50	100	>100
Discharge (cubic feet per second)	1525	1844	>2000
Water Surface Elev at Bridge (ft)	1923.19	1923.80	1927±

Flood plain data based upon information available when the plans were prepared and are shown to meet Federal requirements.The accuracy of said information is not warranted by the County and interested or affected parties should make their own investigations.

LOAD AND RESISTANCE FACTOR DESIGN SPREAD FOOTING DATA TABLE

WORKING STRESS DESIGN (LRFD SERVICE-I LIMIT STATE LOAD COMBINATION)		
LOCATION	PERMISSIBLE GROSS CONTACT STRESS (SETTLEMENT) ksf	ALLOWABLE GROSS BEARING CAPACITY ksf
Abut 1	6	6
Abut 2	6	6

BENCH MARK

No.	Northing	Easting	Elev	Line	Station	Offset	Description
11	2101717.97	6861717.40	1923.79	"A"	108+27.77	152.22' LT	¾" Capped iron pipe
20	2101243.80	6862038.23	1953.23	"A"	102+81.47	19.06' RT	¾" Open iron pipe
44	2101654.70	6862150.92	1925.35	"A"	106+42.76	244.90' RT	1" Capped iron pipe
51	2101795.91	6861869.73	1925.74	"A"	108+58.72	16.06' RT	1¼" Capped iron pipe

Note:
The Contractor shall verify all controlling field dimensions before ordering or fabricating any material.

NOT FOR CONSTRUCTION

GEOTECHNICAL PROFESSIONAL APPROVAL DATE

SCALE:	VERT.DATUM	HORZ.DATUM	DESIGN	J. Quincy	M. Katt
PHOTOGRAMMETRY AS OF:	ALIGNMENT TIES		DETAILS	M. Katt	J. Quincy
SURVEYED BY	DRAFTED BY		QUANTITIES	L. Mason/R. Kotey	M. Ruble/M. Katt
FIELD CHECKED BY	CHECKED BY				

PREPARED FOR THE CITY OF PLACERVILLE DEPARTMENT OF TRANSPORTATION

Maxwell Katt
PROJECT ENGINEER

BRIDGE NO. 25C-0012
POST MILE

HANGTOWN CREEK BRIDGE
FOUNDATION PLAN

FOUNDATION PLAN SHEET (ENGLISH) (REV. 5/9/00)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU
EA

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY): 3/1/2008

SHEET 3 OF 17

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DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
03	ED	BLAIRS LANE			

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REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Maxwell L. Katt — No. C74940 — Exp. 12/30/15 — CIVIL — STATE OF CALIFORNIA

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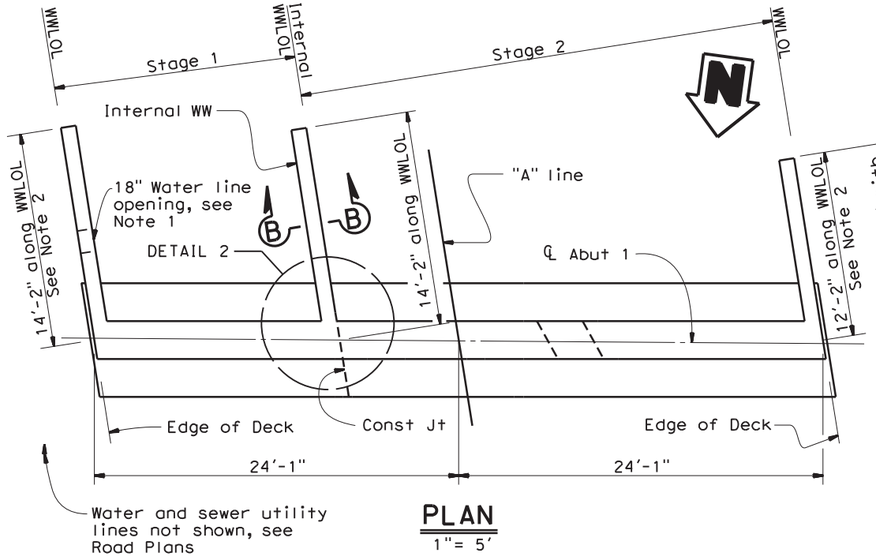
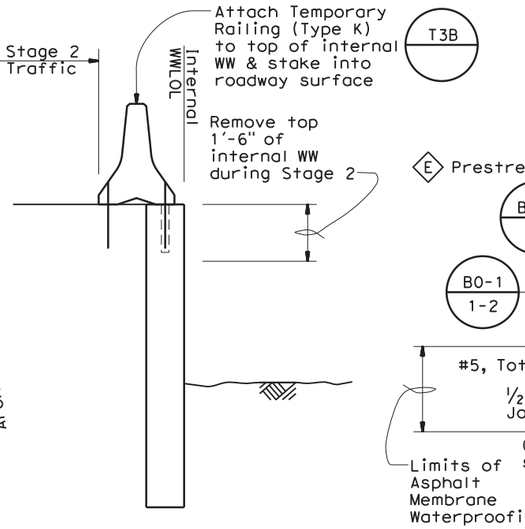
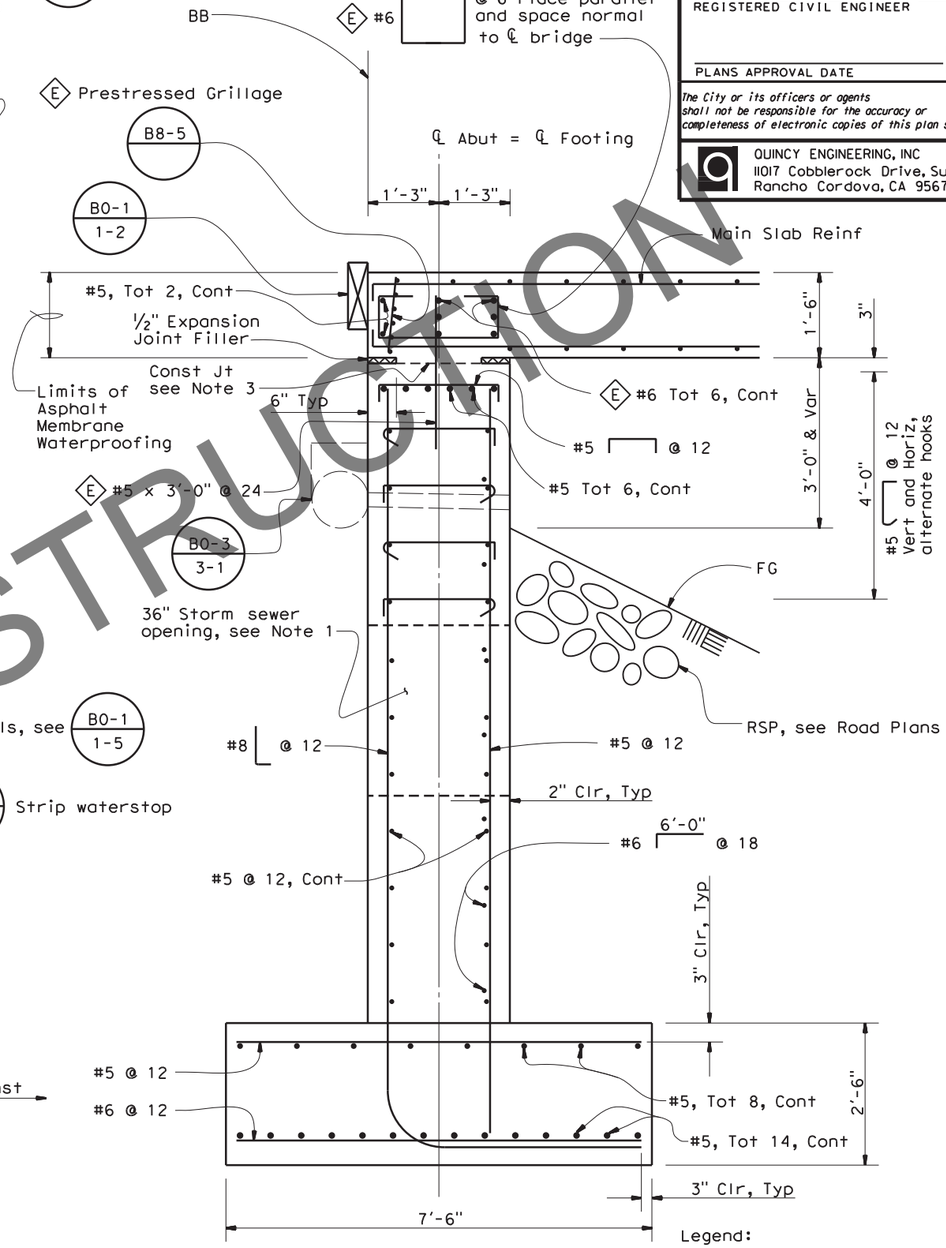


PLAN
1"= 5'



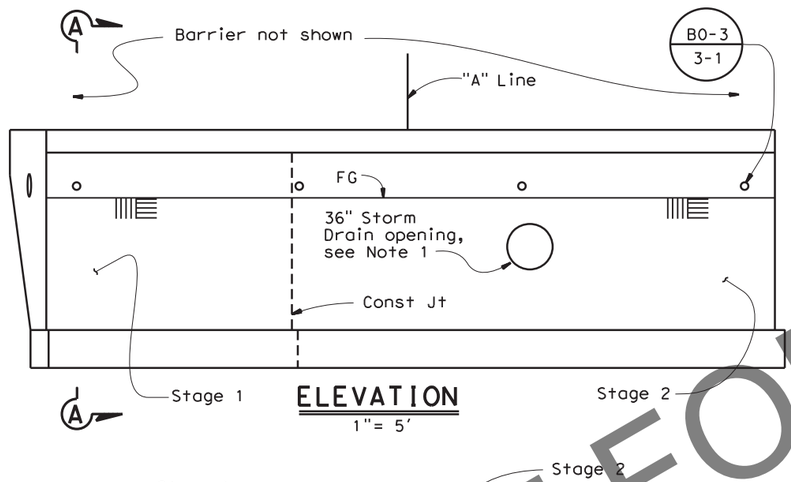
SECTION B-B
1/2"=1'-0"



SECTION A-A
3/4"=1'-0"

Legend:

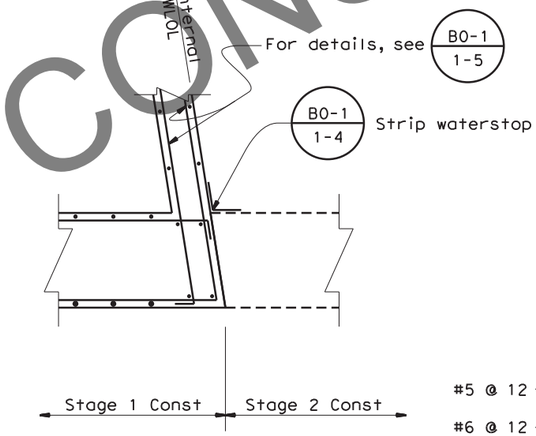
E Denotes epoxy coated bar reinforcement



ELEVATION
1"= 5'

FOOTING PLAN
1"= 5'

Note:
The Contractor shall verify all controlling field dimensions before ordering or fabricating any material.



DETAIL 2
1/2"=1'-0"

Notes:

1. For Utility Opening detail, see "Abutment Details" sheet. For utility location information, see Road Plans.
2. For Wingwall details, see "Miscellaneous Details" sheet.
3. Intentionally roughen Const Jt surface to an amplitude of 1/4".

DESIGN	BY J. Quincy	CHECKED M. Katt	PREPARED FOR THE CITY OF PLACERVILLE DEPARTMENT OF TRANSPORTATION	Maxwell Katt PROJECT ENGINEER	BRIDGE NO. 25C-0012	HANGTOWN CREEK BRIDGE	
DETAILS	BY M. Katt	CHECKED J. Quincy			POST MILE	ABUTMENT 1 LAYOUT	
QUANTITIES	BY L. Mason/R. Kotey	CHECKED M. Ruble/M. Katt					

STRUCTURES DESIGN DETAIL SHEET (ENGLISH) (REV. 9/2/98)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU EA

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REVISION DATES (PRELIMINARY STAGE ONLY): 3/1/2008

SHEET 4 OF 17

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DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
03	ED	BLAIRS LANE			

100% SUBMITTAL

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Maxwell L. Katt — No. C74940 — Exp. 12/30/15 — CIVIL — STATE OF CALIFORNIA

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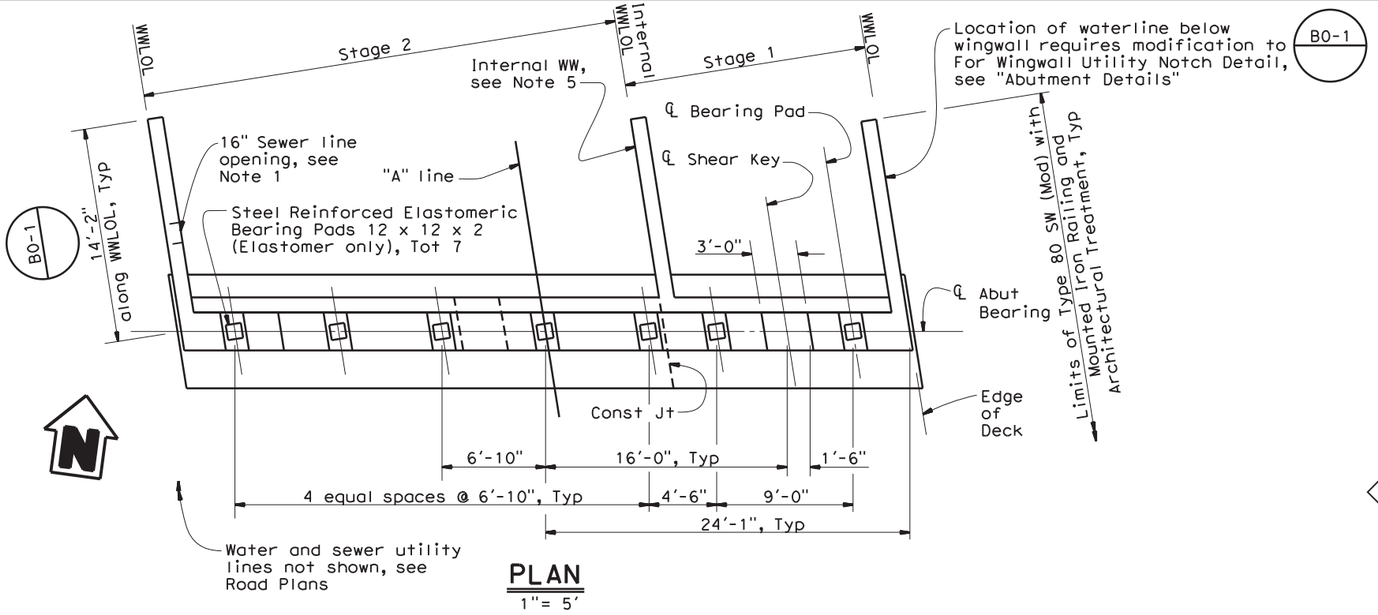
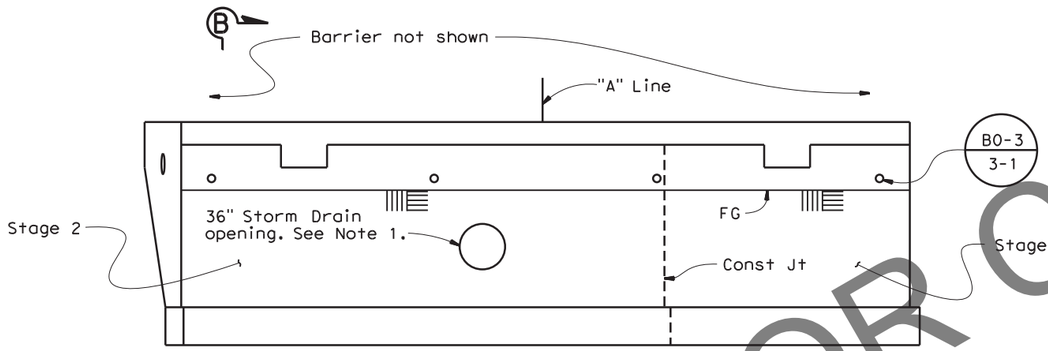
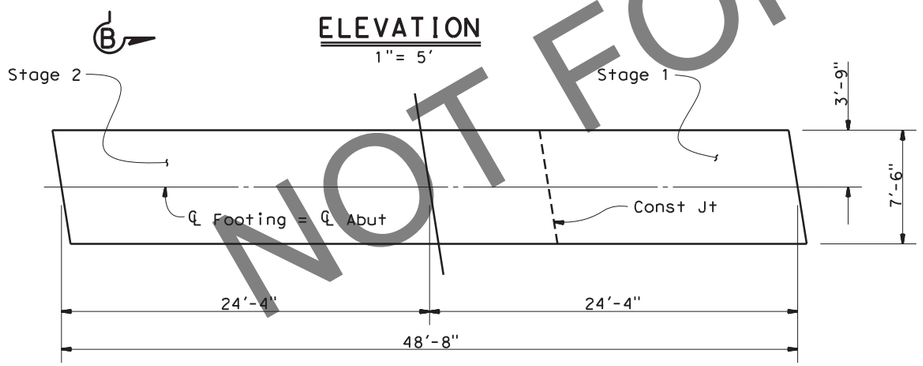


PLAN
1"= 5'



ELEVATION
1"= 5'

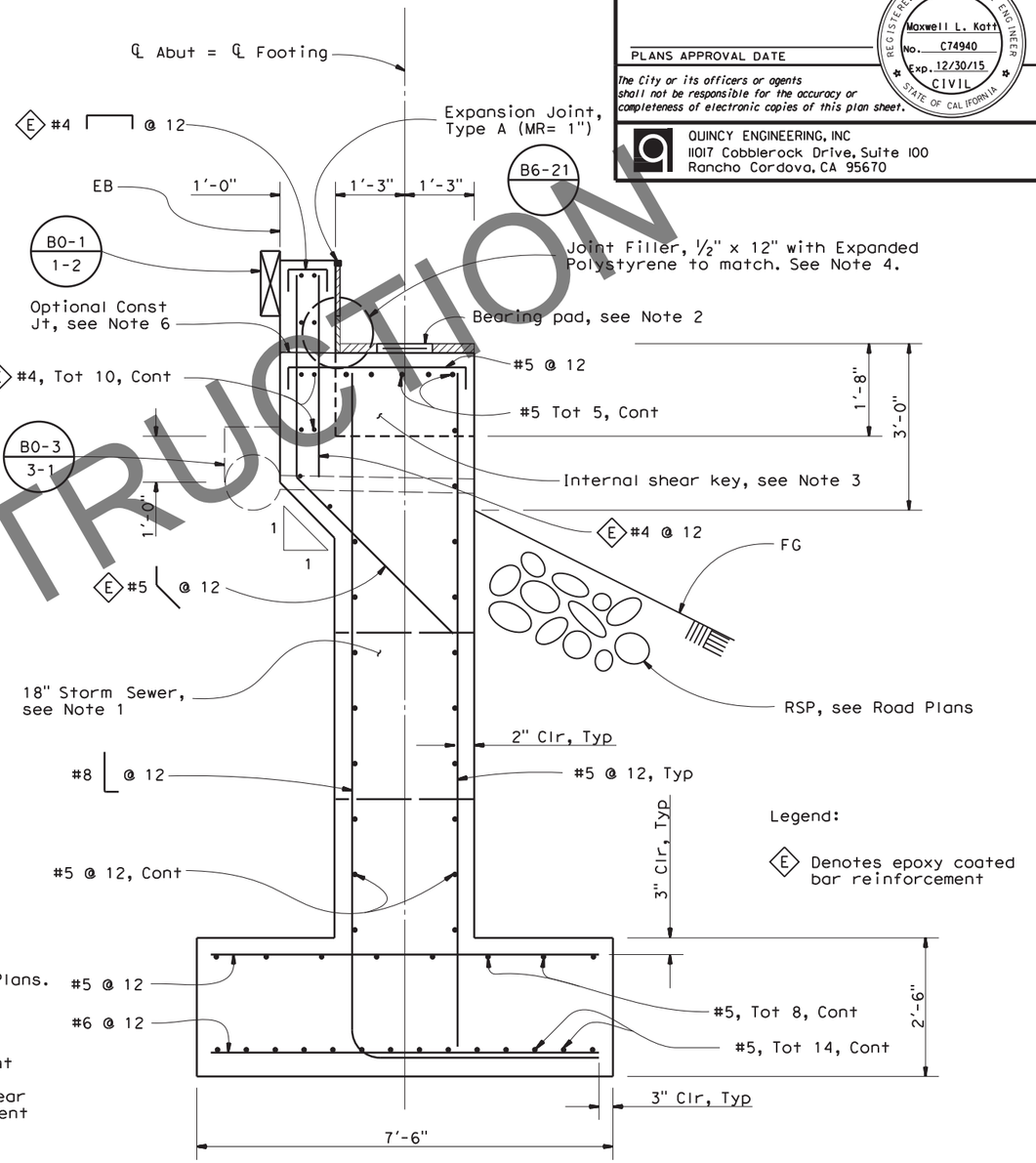


Note:
The Contractor shall verify all controlling field dimensions before ordering or fabricating any material.

FOOTING PLAN
1"= 5'

Notes:

1. For Utility Opening detail, see "Abutment Details" sheet. For Storm Drain design, see Road Plans.
2. For Bearing pad detail, see "Abutment Details" sheet.
3. For Internal shear key abutment reinforcement, see "Abutment Details" sheet. For Internal shear key superstructure reinforcement see "Miscellaneous Details".
4. For Joint Filler details, see "Abutment Details" sheet.
5. For Internal Wingwall details, see "Abutment 1 Layout" sheet.
6. Location of construction joint may be adjusted to accommodate prestressing operations.



SECTION C-C
¾"=1'-0"

		DESIGN	BY J. Quincy	CHECKED M. Katt	PREPARED FOR THE CITY OF PLACERVILLE DEPARTMENT OF TRANSPORTATION	Maxwell Katt PROJECT ENGINEER	BRIDGE NO. 25C-0012
		DETAILS	BY M. Katt	CHECKED J. Quincy			POST MILE
		QUANTITIES	BY L. Mason/R. Kotey	CHECKED M. Ruble/M. Katt			

HANGTOWN CREEK BRIDGE
ABUTMENT 2 LAYOUT

STRUCTURES DESIGN DETAIL SHEET (ENGLISH) (REV. 9/2/98)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

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REVISION DATES (PRELIMINARY STAGE ONLY)										SHEET	OF
3/1/2008										5	17

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DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
03	ED	BLAIRS LANE			

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REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

Maxwell L. Katt No. C74940 Exp. 12/30/15 CIVIL — REGISTERED PROFESSIONAL ENGINEER — STATE OF CALIFORNIA

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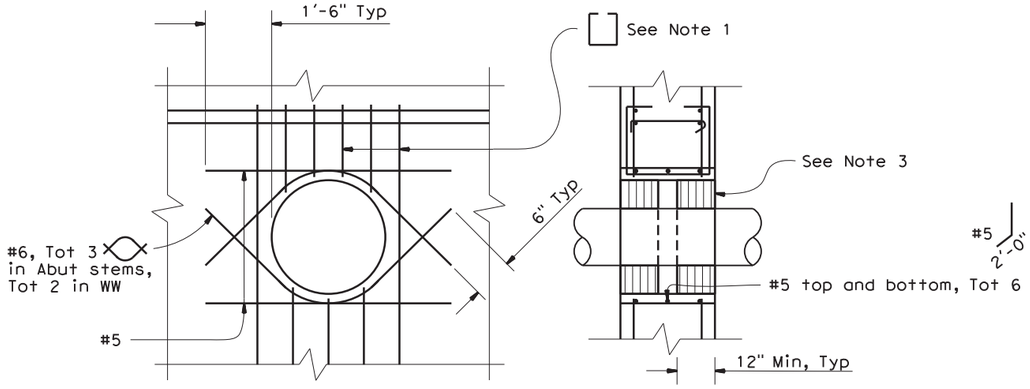
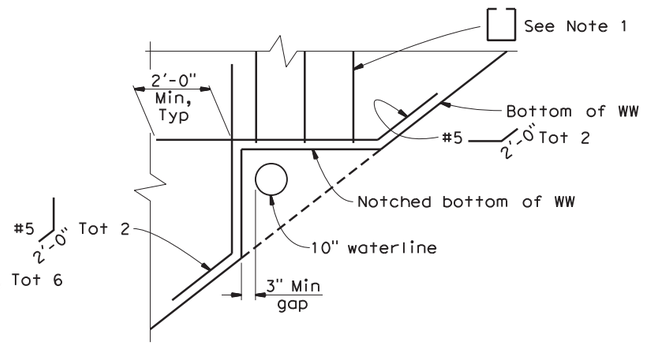


UTILITY OPENING DETAIL

No Scale

Notes:

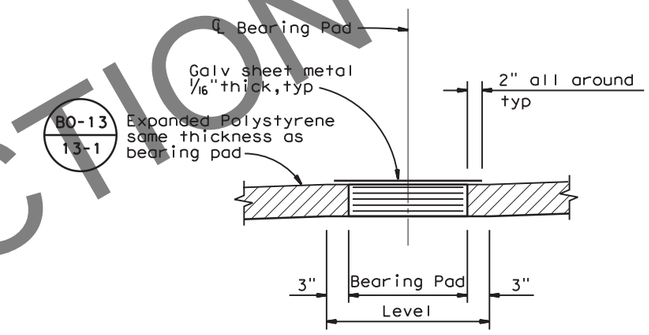
1. Reinforcement to be same shape and bar size with 2/3 the spacing of adjacent reinforcement.
2. All reinforcement detailed to be placed in addition to reinforcement shown in Abutment Section detail on Abutment Layout sheets.
3. Seal utilities at abutments with concrete or mortar, after tightly wrapping utility with 2 layers of 15 LBS building paper.



WINGWALL UTILITY NOTCH

No Scale

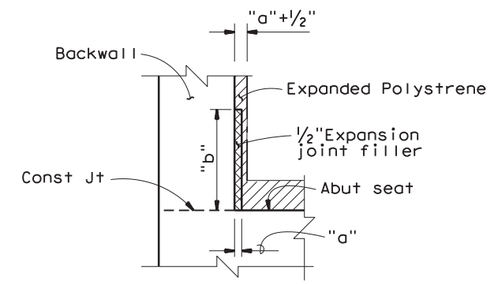
Notes:
This detail only applies to Abutment 2 at waterline location only. Place reinforcement shown in addition to all wingwall reinforcement required by B0-1



Note: Coat top of Bearing Pad with grease prior to placing sheet metal.

BEARING PAD DETAIL

No Scale



JOINT FILLER DETAIL

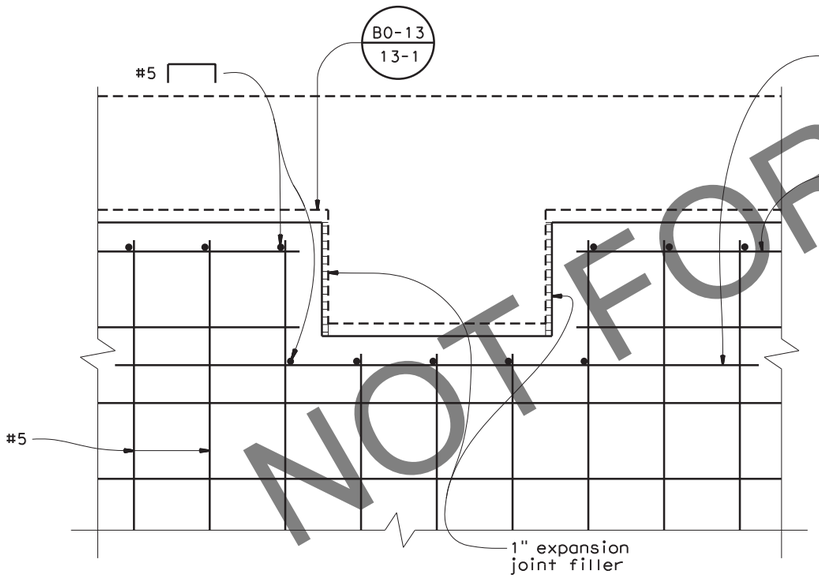
No Scale

Notes:

1. For "a" dimension see B6-21
2. "b" dimension is 1'-2" Typ along backwall and 2'-8" along backwall at internal shear key.

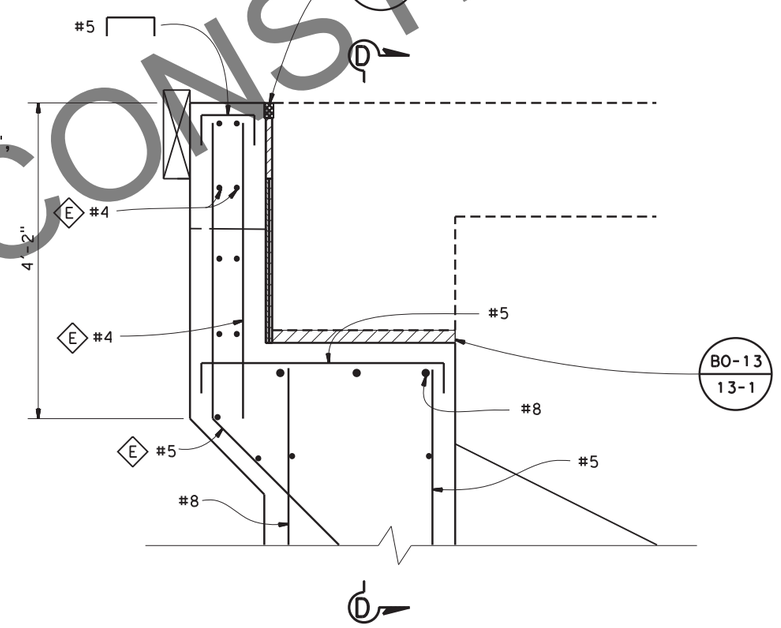
Legend:

(E) Denotes epoxy coated bar reinforcement



SECTION D-D

1"=1'-0"



ABUTMENT SHEAR KEY DETAIL

1"=1'-0"

DESIGN	BY J. Quincy	CHECKED M. Katt	PREPARED FOR THE CITY OF PLACERVILLE DEPARTMENT OF TRANSPORTATION	Maxwell Katt PROJECT ENGINEER	BRIDGE NO. 25C-0012	HANGTOWN CREEK BRIDGE	
DETAILS	BY M. Katt	CHECKED J. Quincy			POST MILE	ABUTMENT DETAILS	
QUANTITIES	BY L. Mason/R. Kotey	CHECKED M. Ruble/M. Katt					

STRUCTURES DESIGN DETAIL SHEET (ENGLISH) (REV. 9/2/98)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

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SHEET 6 OF 17

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DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
03	ED	BLAIRS LANE			

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REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

Maxwell L. Katt, No. C74940, Exp. 12/30/15, CIVIL, REGISTERED PROFESSIONAL ENGINEER, STATE OF CALIFORNIA

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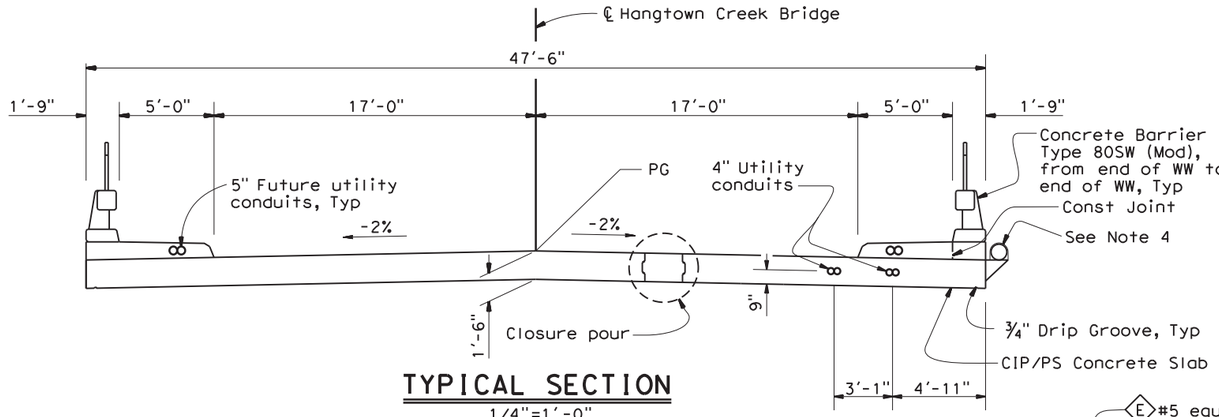
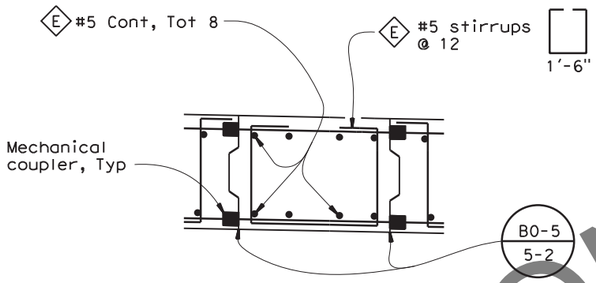


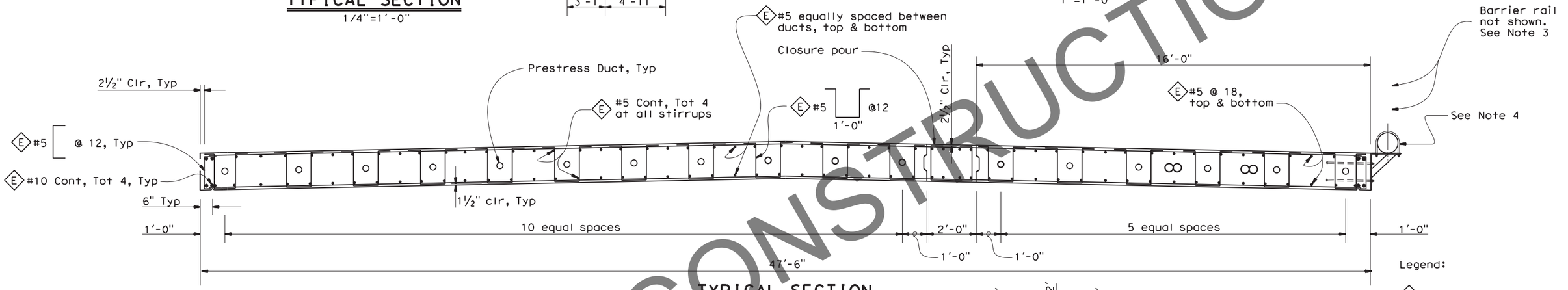
TYPICAL SECTION

1/4"=1'-0"



CLOSURE POUR DETAIL

1"=1'-0"

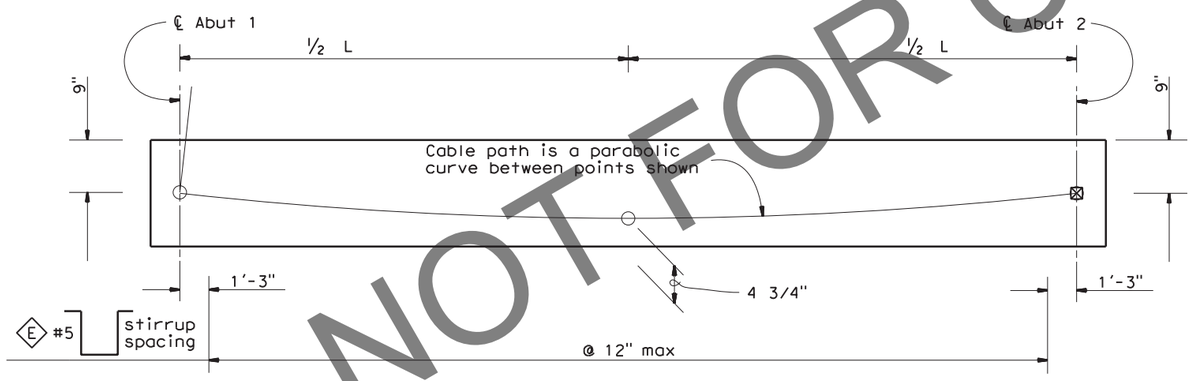


Legend:

#E Denotes epoxy coated bar reinforcement

TYPICAL SECTION

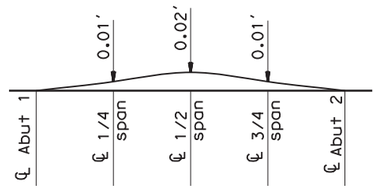
½"=1'-0"



LONGITUDINAL SECTION

NO SCALE

Note:
The constractor shall verify all controlling field dimensions before ordering or fabricating any material



Camber values shown do not include allowances for falsework settlement

CAMBER DIAGRAM

No Scale

Notes:

1. Falsework Release Alternative 1: Falsework shall be released as soon as permitted by the specifications. Closure pour shall not be placed sooner than 60 days after the falsework has been released.
2. Falsework Release Alternative 2: Falsework shall not be released less than 28 days after the last concrete has been placed. Closure pour shall not be placed sooner than 14 days after the falsework has been released. When Falsework Alternate 2 is used, camber valves are 0.75 times those shown.
3. For Barrier reinforcement details, see "Barrier Details" sheet.
4. For Pipe Bracket Details, see "Miscellaneous Details" sheet. Maximum bracket spacing is 8'-0".

PRESTRESSING NOTES

270 KSI Low Relaxation Strand:

P_{jack} = 8960 kips

Anchor Set = 3/8 in

Total Number of Ducts = 17

Distribution of prestress force (Pjack) between ducts shall not exceed the ratio of 3:2. Maximum final force variation between ducts shall not exceed 725 kips.

Concrete: f'_c = 5000 psi @ 28 days

f'_{ci} = 3500 psi @ time of stressing

Contractor shall submit elongation calculations based on initial stress at

☒ = 0.982 times jacking stress.

μ = 0.15 K = 0.0002

Jacking shall be performed at Abutment 1.

DESIGN	BY J. Quincy	CHECKED M. Katt	PREPARED FOR THE CITY OF PLACERVILLE DEPARTMENT OF TRANSPORTATION	Maxwell Katt PROJECT ENGINEER	BRIDGE NO. 25C-0012	HANGTOWN CREEK BRIDGE	
DETAILS	BY M. Katt	CHECKED J. Quincy			POST MILE	TYPICAL SECTION	
QUANTITIES	BY L. Mason/R. Katey	CHECKED M. Ruble/M. Katt					

STRUCTURES DESIGN DETAIL SHEET (ENGLISH) (REV. 9/2/98)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU EA

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY): 3/1/2008

SHEET 7 OF 17

FILE =>S:\Client\PLACERVI\p07-300\CAD\pl96a\pl96atsl.dgn

3/10/2015 9:48:51 AM

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
03	ED	BLAIRS LANE			

100% SUBMITTAL

REGISTERED CIVIL ENGINEER

Maxwell L. Katt
No. C74940
Exp. 12/30/15
CIVIL
REGISTERED PROFESSIONAL ENGINEER
STATE OF CALIFORNIA

PLANS APPROVAL DATE

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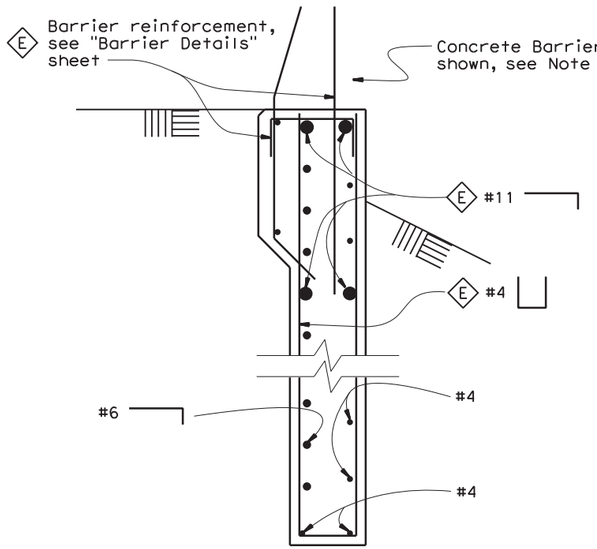
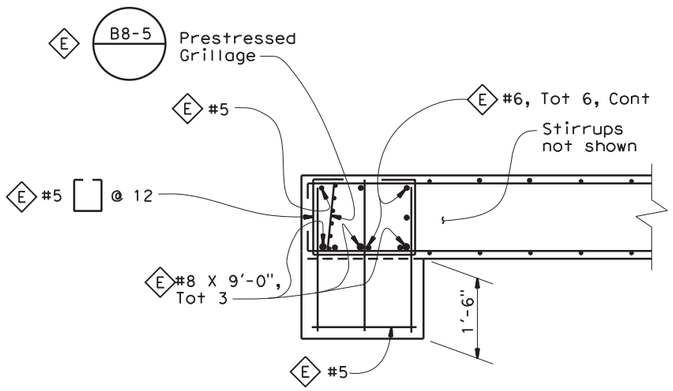
Rancho Cordova, CA 95670

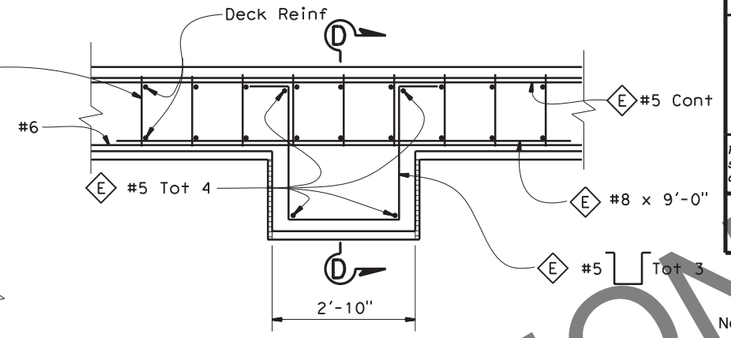
NOT FOR CONSTRUCTION



SECTION E-E
1/2"=1'-0"



SECTION D-D
No Scale



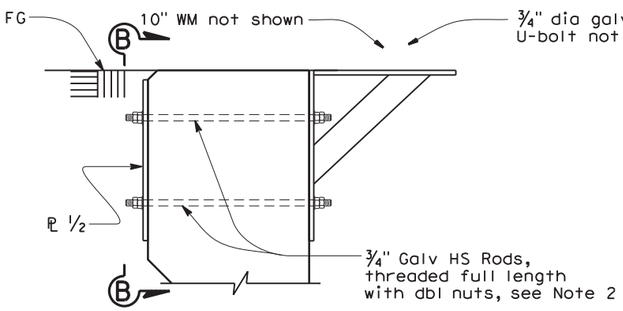
SHEAR KEY
No Scale

Notes:

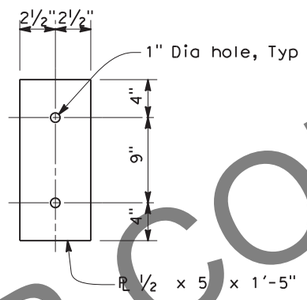
1. For Barrier reinforcement details, see "Barrier Details" Sheet.
2. Contractor may propose and substitute alternative cast-in-place anchors with approval of the Engineer.

Legend:

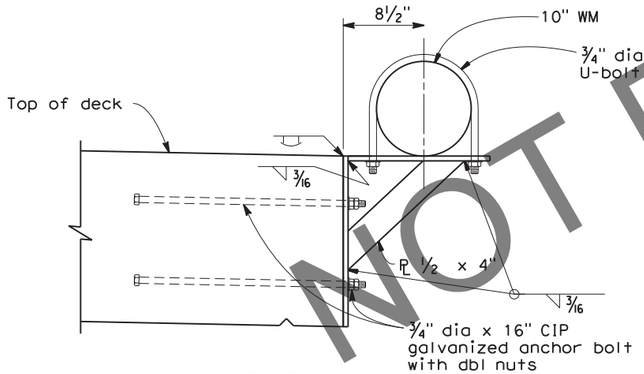
#5 Denotes epoxy coated bar reinforcement



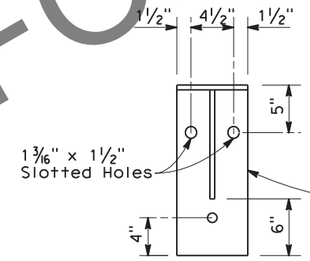
BRACKET ELEVATION ON WINGWALL



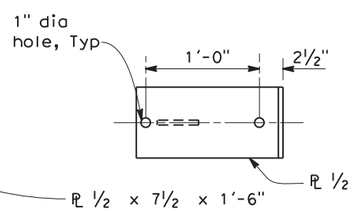
VIEW B-B



BRACKET ELEVATION ON BRIDGE



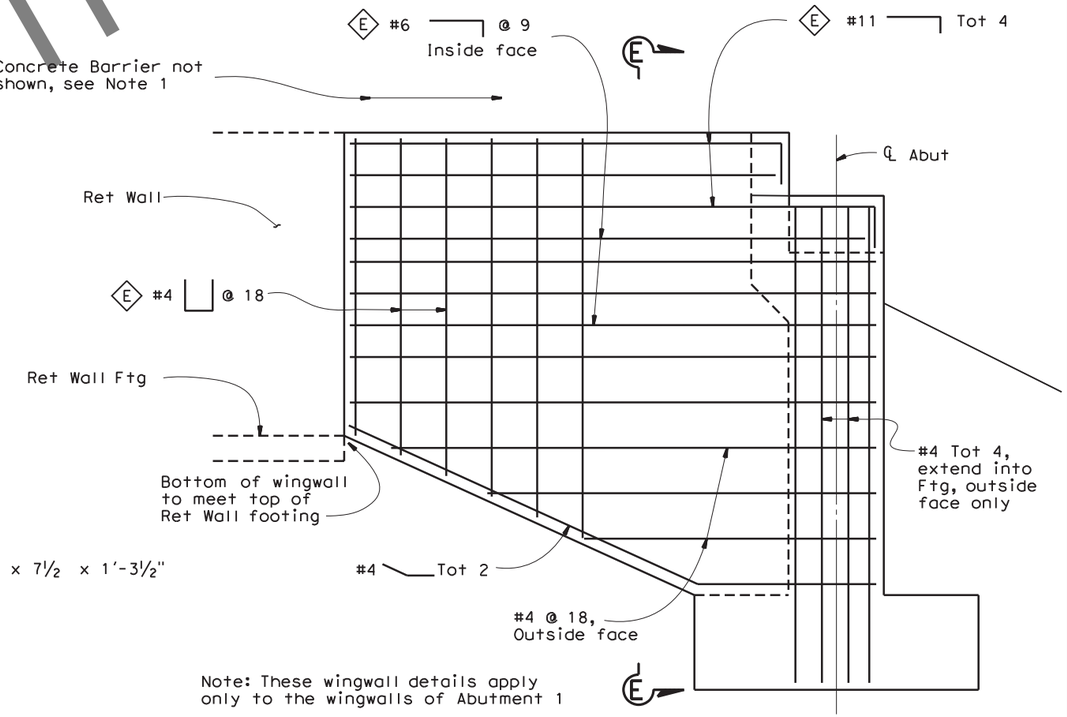
VIEW A-A



BRACKET PLAN

Note:
The Contractor shall verify all controlling field dimensions before ordering or fabricating any material

PIPE BRACKET DETAILS
1 1/2"=1'-0"



Note: These wingwall details apply only to the wingwalls of Abutment 1

WING WALL DETAIL
1/2"=1'-0"

DESIGN	BY J. Quincy	CHECKED M. Katt	PREPARED FOR THE CITY OF PLACERVILLE DEPARTMENT OF TRANSPORTATION	Maxwell Katt PROJECT ENGINEER	BRIDGE NO. 25C-0012	HANGTOWN CREEK BRIDGE
DETAILS	BY M. Katt	CHECKED J. Quincy			POST MILE	MISCELLANEOUS DETAILS
QUANTITIES	BY L. Mason/R. Kotey	CHECKED M. Ruble/M. Katt				

STRUCTURES DESIGN DETAIL SHEET (ENGLISH) (REV. 9/2/98)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU EA

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY): 3/1/2008

SHEET 8 OF 17

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DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
03	ED	BLAIRS LANE			

100% SUBMITTAL

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Maxwell L. Katt — No. C74940 — Exp. 12/30/15 — CIVIL — STATE OF CALIFORNIA

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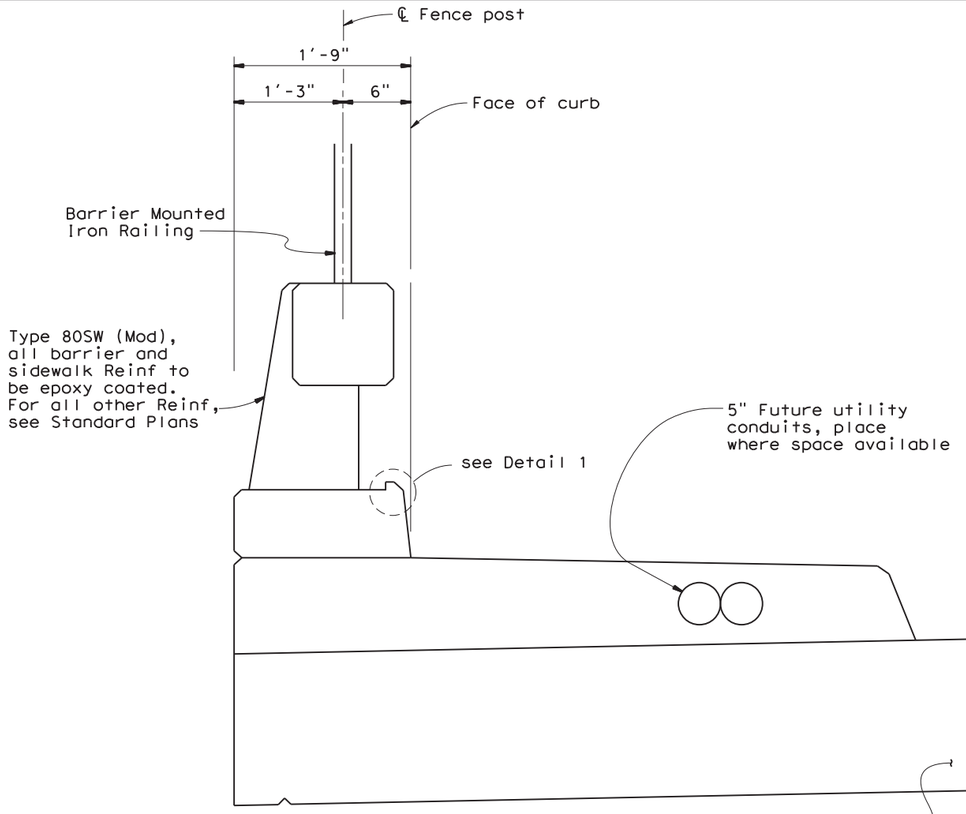
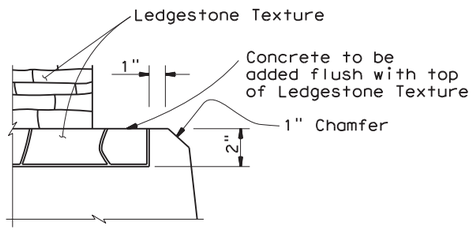
Rancho Cordova, CA 95670



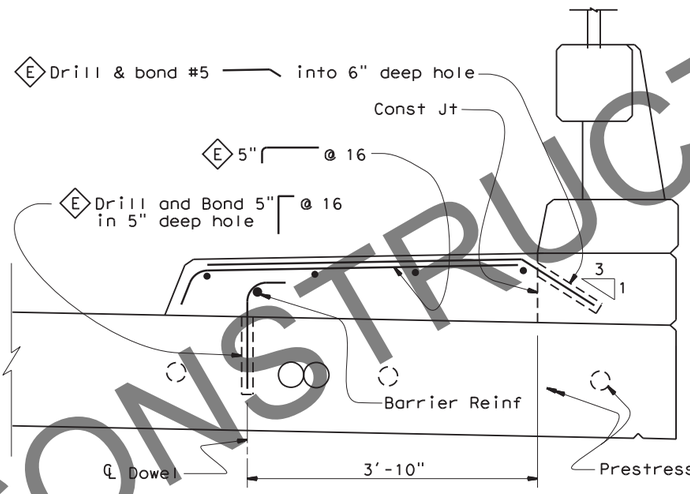
TYPICAL SECTION

No Scale



DETAIL 1

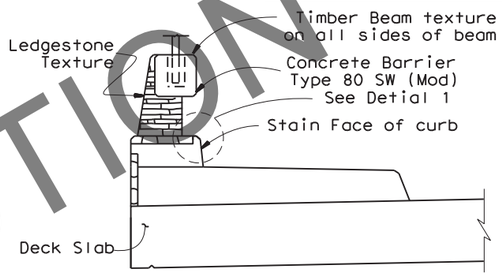
No Scale



CONSTRUCTION DETAIL

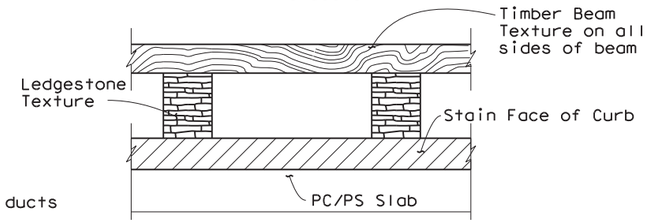
No Scale

Detail for staged construction of Type 80SW (Mod), applies to right side bridge barrier only. For all other Reinf, see Standard Plans



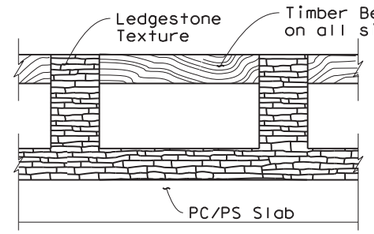
ARCHITECTURAL TREATMENT SECTION VIEW

No Scale



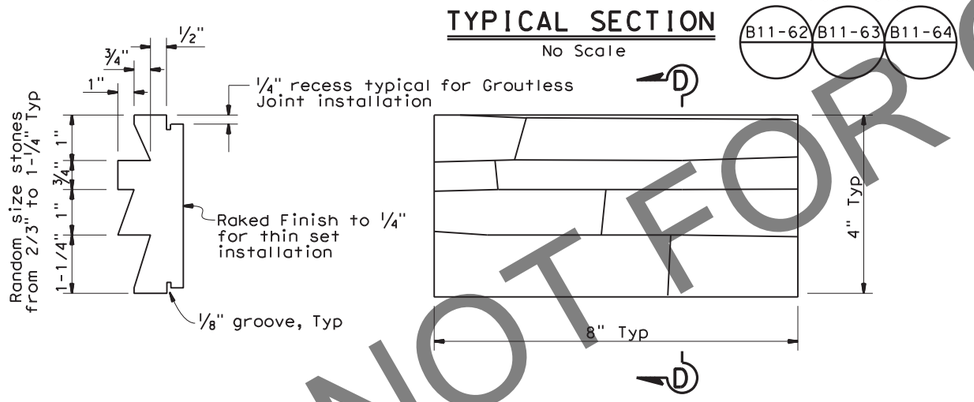
INTERIOR VIEW

No Scale



EXTERIOR VIEW

No Scale



SECTION D-D

ELEVATION

LEDGESTONE TEXTURE VENEER

No Scale

Note:
The Contractor shall verify all controlling field dimensions before ordering or fabricating any material

Notes:

1. Typical section shown is for left side of bridge barrier. Right side bridge barrier similar, see Construction Detail.
2. A minimum of two 5" round openings are required for future utilities in addition to those on other plan sheets. Openings are to be sealed at ends and extended 8" minimum past end of sidewalk. Duct forms are to be tied down.
3. Splicing of longitudinal reinforcement shall be by mechanical butt splicing or mechanical lap splicing only. No lap splicing allowed on the longitudinal rail reinforcing. Splicing shall be staggered.
4. All reinforcement placed in Type 80 SW (Mod) to be epoxy coated.

NOT FOR CONSTRUCTION

	BY	CHECKED
DESIGN	J. Quincy	M. Katt
DETAILS	M. Katt	J. Quincy
QUANTITIES	L. Mason/R. Kotey	M. Ruble/M. Katt

PREPARED FOR THE CITY OF PLACERVILLE DEPARTMENT OF TRANSPORTATION

Maxwell Katt
PROJECT ENGINEER

CU
EA

BRIDGE NO.	25C-0012
POST MILE	

HANGTOWN CREEK BRIDGE
BARRIER DETAILS

STRUCTURES DESIGN DETAIL SHEET (ENGLISH) (REV. 9/2/98)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY): 3/1/2008

SHEET 9 OF 17

3/10/2015 9:48:57 AM

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DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
03	ED	BLAIRS LANE			

100% SUBMITTAL

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

Maxwell L. Katt
No. C74940
Exp. 12/30/15
CIVIL
REGISTERED PROFESSIONAL ENGINEER
STATE OF CALIFORNIA

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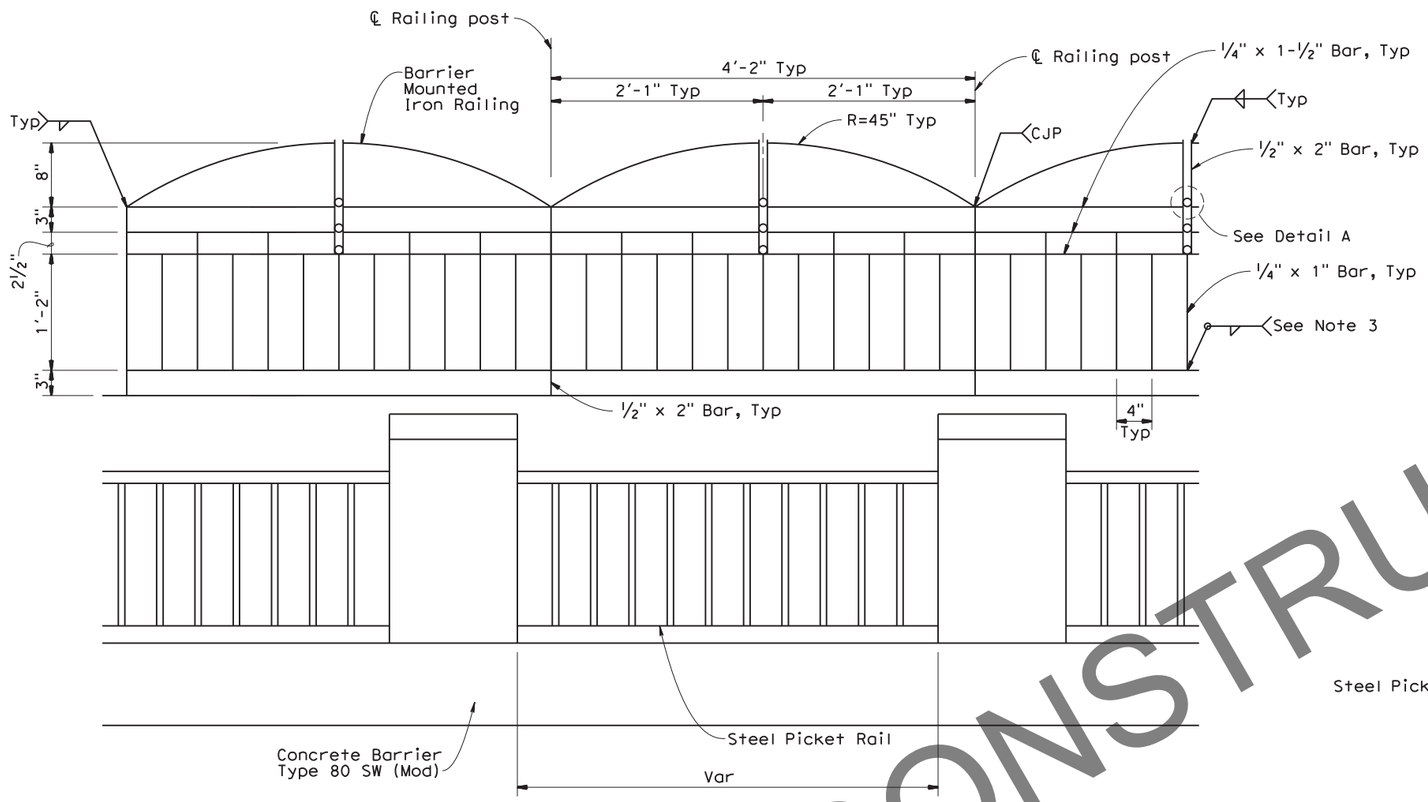
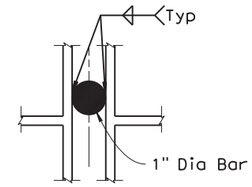


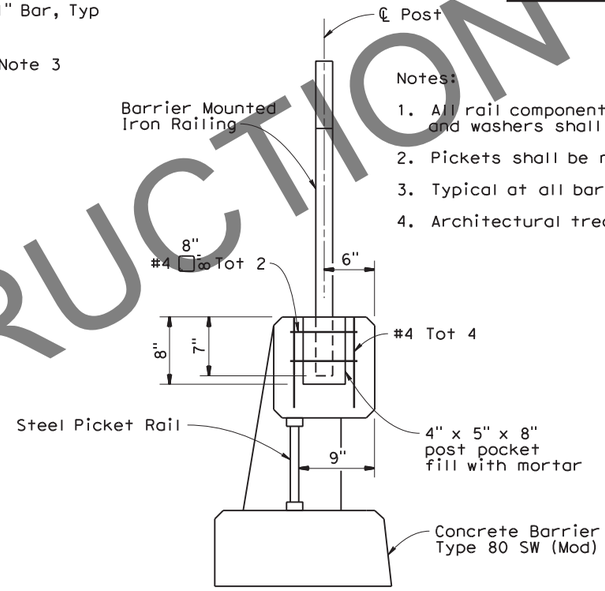
BARRIER MOUNTED IRON RAILING ELEVATION

No Scale



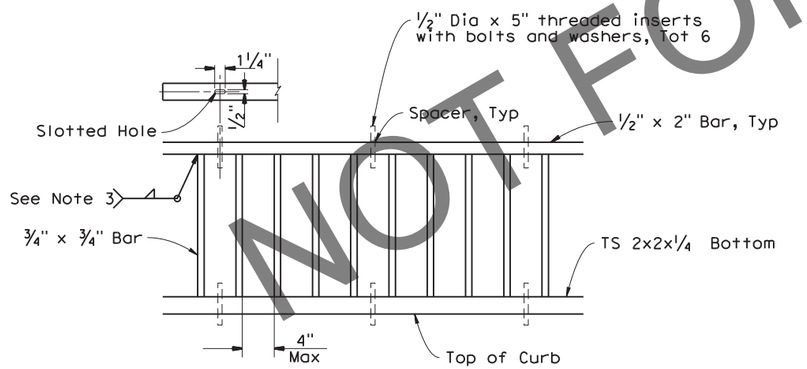
DETAIL A

No Scale

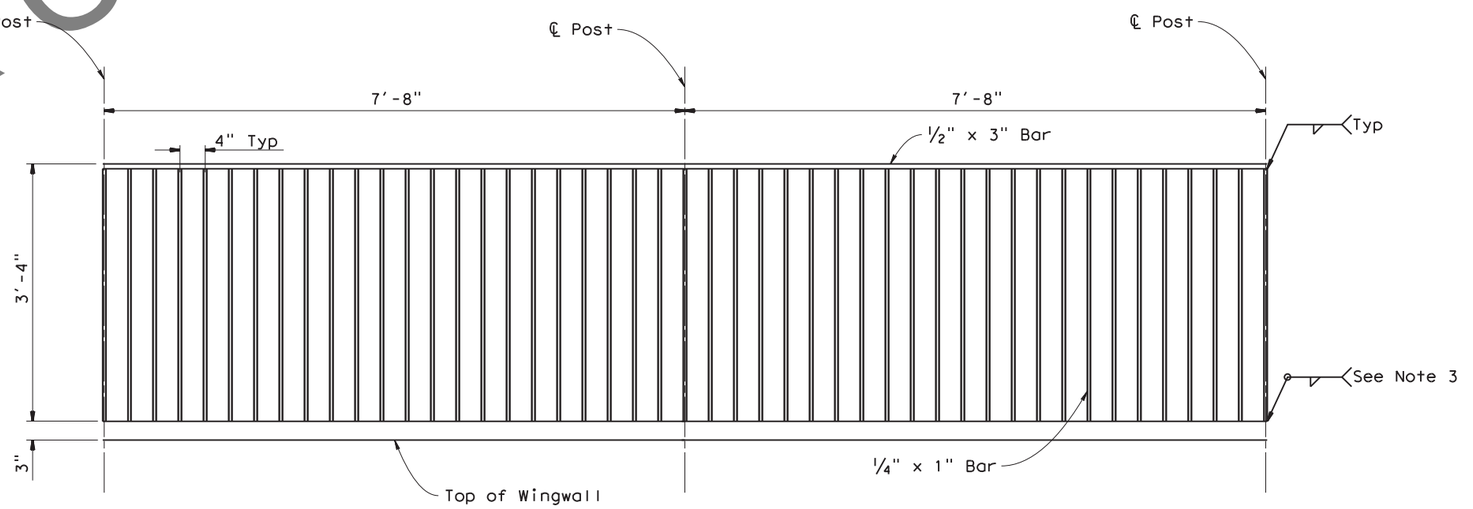


Notes:

1. All rail components including inserts, bolts and washers shall be painted.
2. Pickets shall be normal to railing.
3. Typical at all bar intersections, except as noted.
4. Architectural treatment not shown for clarity.



Note:
The Contractor shall verify all controlling field dimensions before ordering or fabricating any material



NOT FOR CONSTRUCTION

DESIGN	BY J. Quincy	CHECKED M. Katt	PREPARED FOR THE CITY OF PLACERVILLE DEPARTMENT OF TRANSPORTATION	Maxwell Mason PROJECT ENGINEER	BRIDGE NO. 25C-0012	HANGTOWN CREEK BRIDGE
DETAILS	BY M. Katt	CHECKED J. Quincy			POST MILE	IRON RAILING DETAILS
QUANTITIES	BY L. Mason/R. Kotey	CHECKED M. Ruble/M. Katt				

STRUCTURES DESIGN DETAIL SHEET (ENGLISH) (REV. 9/2/98)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

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REVISION DATES (PRELIMINARY STAGE ONLY): 3/1/2008

SHEET 10 OF 17

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DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
03	ED	BLAIRS LN			

100% SUBMITTAL

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Leland Mason — No. 62500 — Exp. 9/30/15 — CIVIL — STATE OF CALIFORNIA

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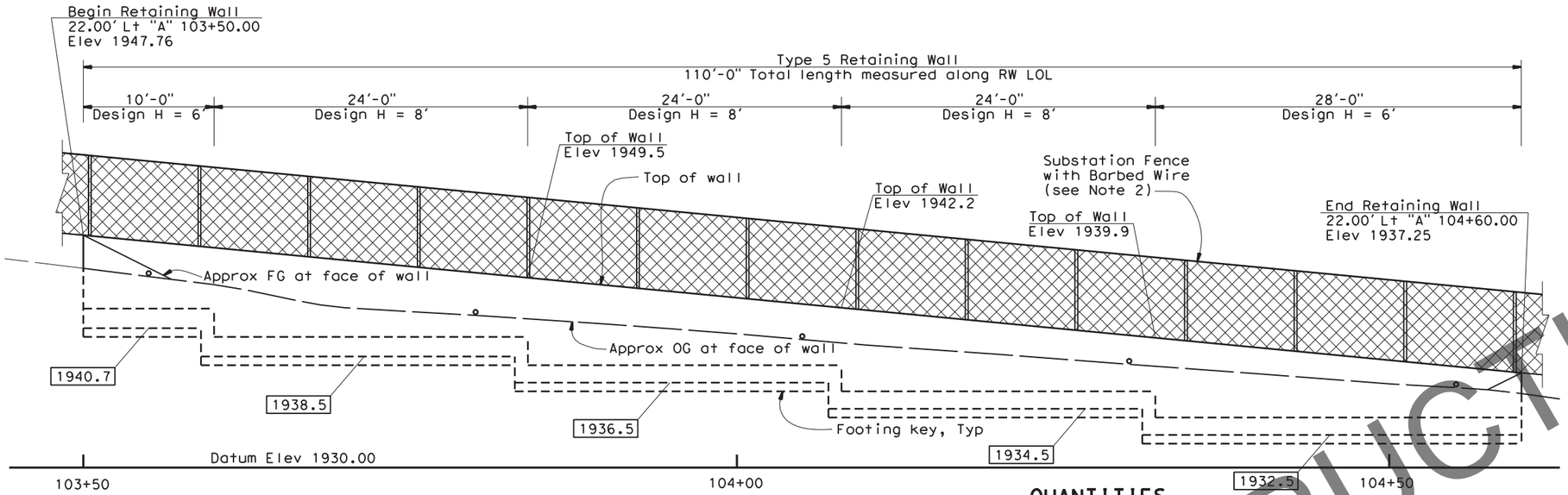
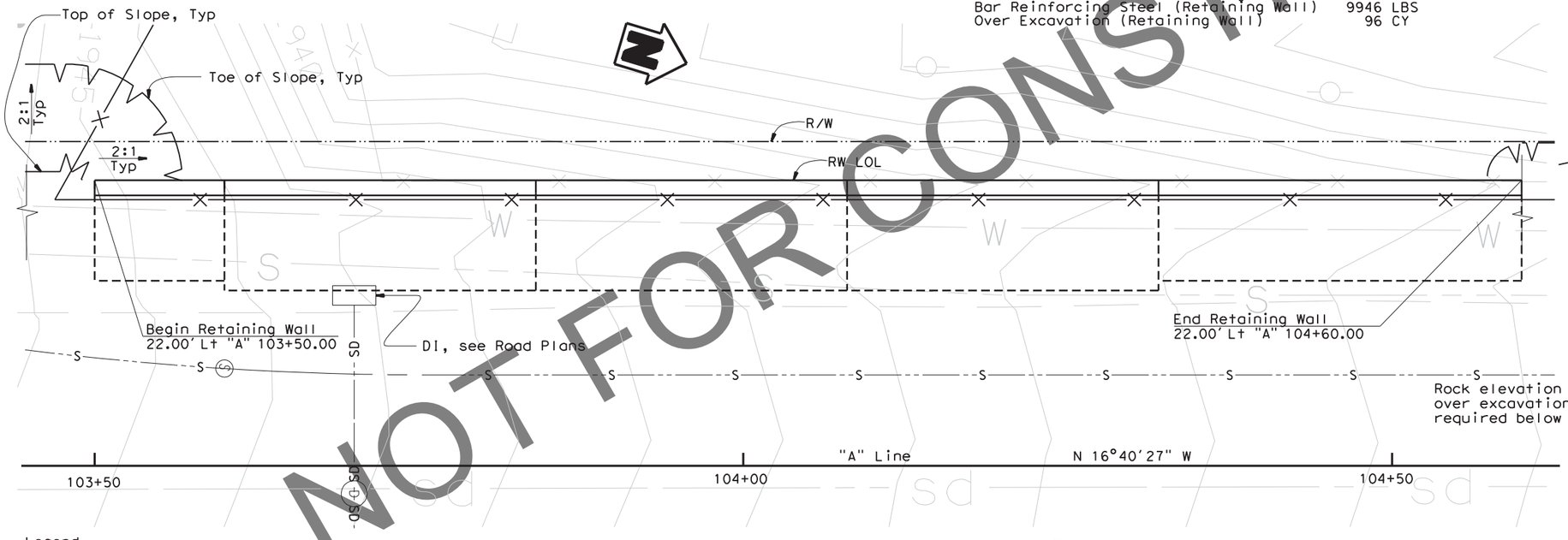


MIRROR ELEVATION

1"= 5'

QUANTITIES

Structure Excavation (Retaining Wall)	173 CY
Structure Backfill (Retaining Wall)	218 CY
Class 2 Aggregate Base	96 CY
Structural Concrete (Retaining Wall)	85 CY
Bar Reinforcing Steel (Retaining Wall)	9946 LBS
Over Excavation (Retaining Wall)	96 CY



PLAN

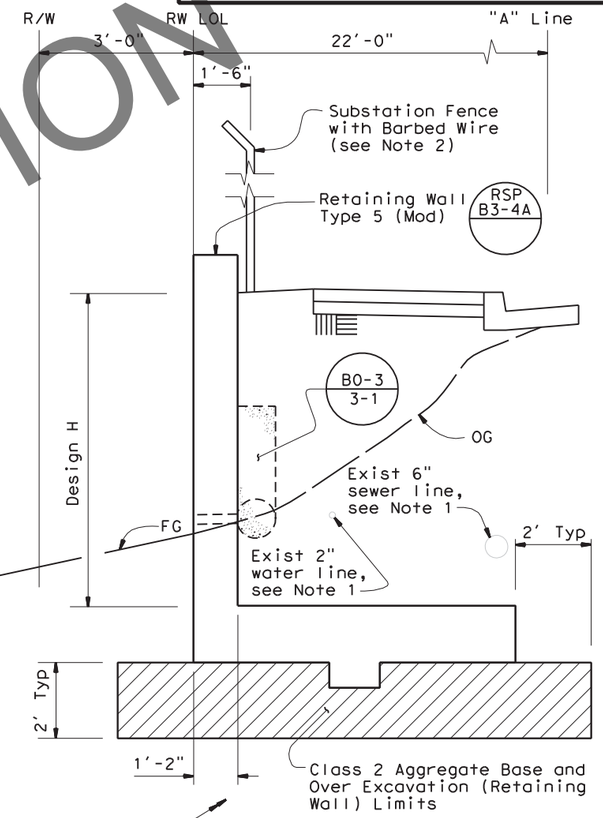
1"= 5'

Legend

XXXX.X Bottom of footing elevation

Notes:

1. Existing water and sewer lines to be relocated, see Road Plans.
2. For Substation Fence details, see Road Plans.
3. For Roadway Earthwork Pay Limits, see Road Quantities.



TYPICAL SECTION

1/2"=1'-0"

STANDARD PLANS DATED 2010

	A10A	Abbreviations (Sheet 1 of 2)
RSP	A10B	Abbreviations (Sheet 2 of 2)
	A10C	Symbols (Sheet 1 of 3)
	A10D	Symbols (Sheet 2 of 3)
	A10E	Symbols (Sheet 3 of 3)
	A62B	Limits of Payment for Excavation and Backfill Bridge Surcharge and Wall
	B0-3	Bridge Details
RSP	B3-4A	Retaining Wall Type 5 (Case 1)
RSP	B3-5	Retaining Wall Details No. 1

STANDARD PLAN SHEET NO.

DETAIL NO.

DESIGN	BY L. Mason	CHECKED J. Quincy	LOAD AND RESISTANCE FACTOR DESIGN	LIVE LOADING: HL93 WITH "LOW BOY" AND PERMIT DESIGN LOAD		PREPARED FOR THE CITY OF PLACERVILLE DEPARTMENT OF TRANSPORTATION	Leland Mason PROJECT ENGINEER
DETAILS	BY L. Mason	CHECKED J. Quincy	LAYOUT	BY L. Mason	CHECKED J. Quincy		
QUANTITIES	BY R. Kotey	CHECKED M. Katt	SPECIFICATIONS	BY K. Gallagher	PLANS AND SPECS COMPARED		

BRIDGE NO.

POST MILES

RETAINING WALL No. 1

GENERAL PLAN

DESIGN GENERAL PLAN SHEET (ENGLISH) (REV.5/9/00)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU EA

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 11 OF 17

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STANDARD PLANS DATED 2010

	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)
	A62B	Limits of Payment for Excavation and Backfill Bridge Surcharge and Wall
	A85	Chain Link Fence
	A85A	Chain Link Fence Details

STANDARD PLAN SHEET NO.

DETAIL NO.

QUANTITIES

	Modular Block Wall	1769 SF
*	Structure Excavation (Modular Block Wall)	330 CY
*	Structure Backfill (Modular Block Wall)	450 CY
*	Class 2 Aggregate (Modular Block Wall) Base	15 CY
*	Permeable Material (Modular Block Wall)	90 CY

* Denotes informational quantity. Payment is included in Modular Block Wall. Estimated quantities assume minimum wall embedment of 2.0 ft below FG at outside face of wall, a design wall height of 8.0 ft, and a base width of 10 ft. These quantities are provided to the Contractor as a courtesy and are for information purposes only. The actual modular block wall system selected by the Contractor may be different and will determine the actual quantities required for the work.

Notes:

1. Layout line shown represents top outside face of wall assuming zero wall batter. Contractor to adjust bottom of wall position based on actual Modular block wall system selected.
2. For Section A-A and Typical Section, see "Details" sheet.
3. For limits of Chain Link Fence (Type CL-6), see Road Plans.
4. Various trees to remain, see Road Plans.
5. For Design Notes and details not shown, see Retaining Walls No. 2 & 4 Details No. 1 and Retaining Walls No. 2 & 4 Details No. 2 sheets.
6. For Roadway Earthwork Pay Limits, see Road Quantities.
7. Wall curve radii may be different than shown based on modular block wall system selected by Contractor.

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
03	ED	BLAIRS LN			

100% SUBMITTAL

REGISTERED CIVIL ENGINEER

Leland Mason No. 62500 Exp. 9/30/15 CIVIL — REGISTERED PROFESSIONAL ENGINEER — STATE OF CALIFORNIA

PLANS APPROVAL DATE

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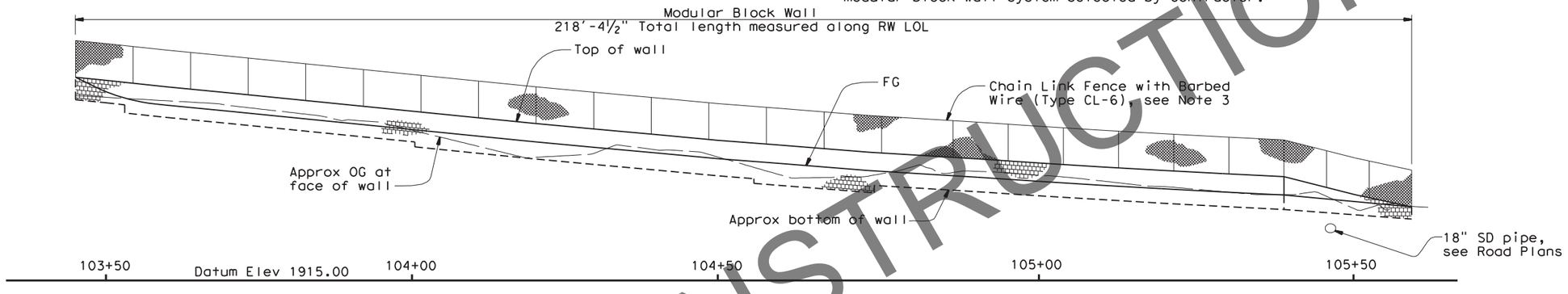
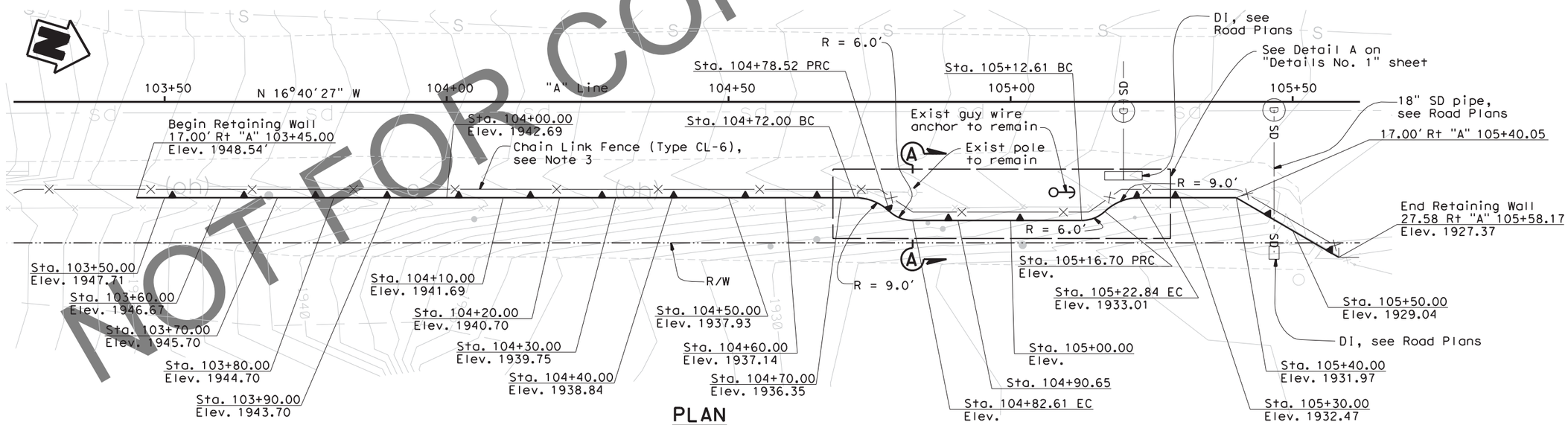
Rancho Cordova, CA 95670



DEVELOPED MIRROR ELEVATION

1"= 10'



PLAN

1"= 10'

NOT FOR CONSTRUCTION

DESIGN	BY M. Ruble	CHECKED V. Doctolero	LOAD AND RESISTANCE FACTOR DESIGN	LIVE LOADING: HL93 WITH "LOW BOY" AND PERMIT DESIGN LOAD		PREPARED FOR THE CITY OF PLACERVILLE DEPARTMENT OF TRANSPORTATION	Leland Mason PROJECT ENGINEER
DETAILS	BY M. Ruble	CHECKED V. Doctolero	LAYOUT	BY M. Ruble	CHECKED V. Doctolero		
QUANTITIES	BY R. Kotey	CHECKED M. Katt	SPECIFICATIONS	BY K. Gallagher	PLANS AND SPECS COMPARED		

BRIDGE NO.

POST MILES

RETAINING WALL No. 2

GENERAL PLAN

DESIGN GENERAL PLAN SHEET (ENGLISH) (REV.5/9/00)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU EA

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 12 OF 17

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DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
03	ED	BLAIRS LN			

100% SUBMITTAL

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Leland Mason — No. 62500 — Exp. 9/30/15 — CIVIL — STATE OF CALIFORNIA

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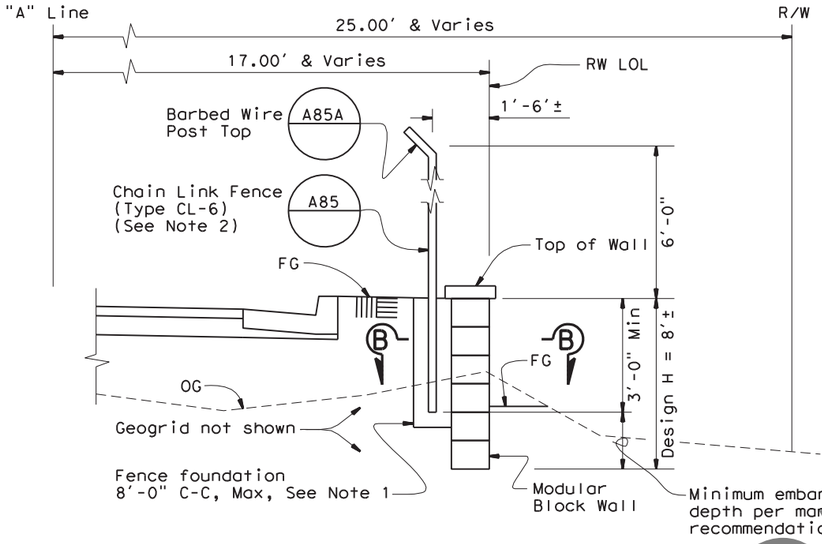
QUINCY ENGINEERING, INC
11017 Cobblerock Drive, Suite 100
Rancho Cordova, CA 95670

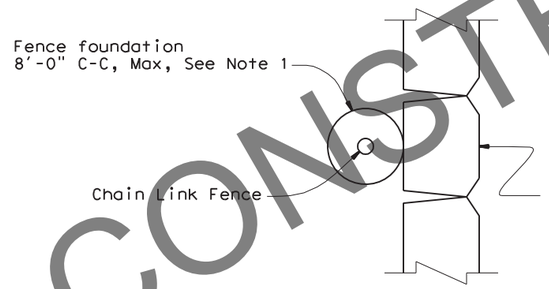
Notes:

1. Concrete filled tube or other manufacturer recommended fence foundation. Foundation tube or other blockout to be set during the wall construction, do not cut through geogrid.
2. Modify post spacing to avoid drainage inlet locations.
3. For drainage inlet locations, see Drainage Plans.
4. During drainage system construction, do not cut through geogrid.
5. Do not disturb existing utility pole or guy anchors within exclusion zone. Contractor to determine alternate wall anchorage, such as soil nails or screw anchors, as required.



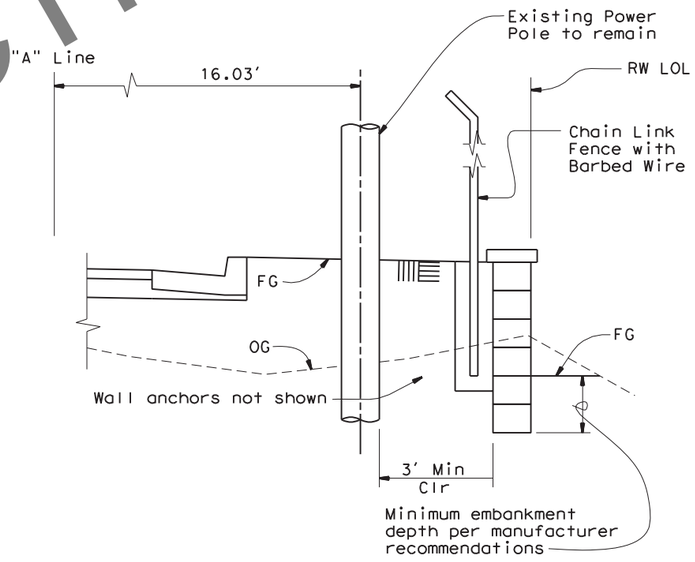
TYPICAL SECTION

1/2"=1'-0"



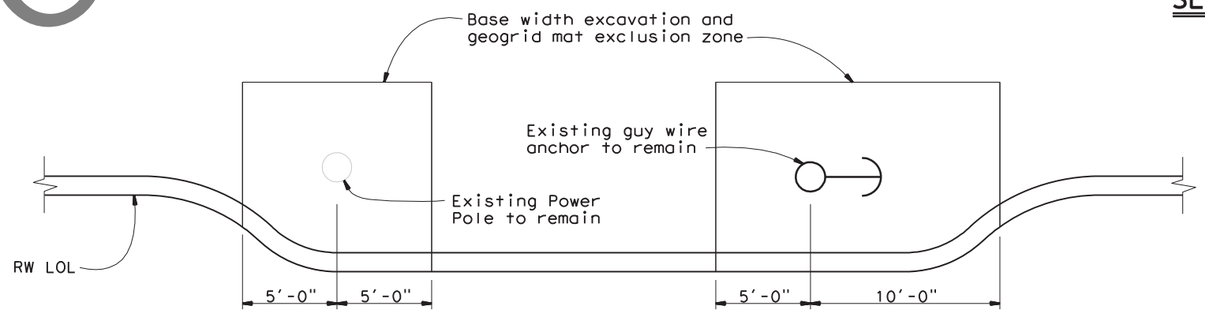
SECTION B-B

1"=1'-0"



SECTION A-A

1/2"=1'-0"



DETAIL A

1"=1'-0"

NOT FOR CONSTRUCTION

DESIGN	BY M. Ruble	CHECKED V. Doctolero	LOAD AND RESISTANCE FACTOR DESIGN	LIVE LOADING: HL93 WITH "LOW BOY" AND PERMIT DESIGN LOAD		PREPARED FOR THE CITY OF PLACERVILLE DEPARTMENT OF TRANSPORTATION	Leland Mason PROJECT ENGINEER
DETAILS	BY M. Ruble	CHECKED V. Doctolero	LAYOUT	BY M. Ruble	CHECKED V. Doctolero		
QUANTITIES	BY R. Kotey	CHECKED M. Katt	SPECIFICATIONS	BY K. Gallagher	PLANS AND SPECS COMPARED		

BRIDGE NO.

POST MILES

RETAINING WALLS No. 2 & 4
DETAILS No. 1

DESIGN GENERAL PLAN SHEET (ENGLISH) (REV.5/9/00)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU EA

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 13 OF 17

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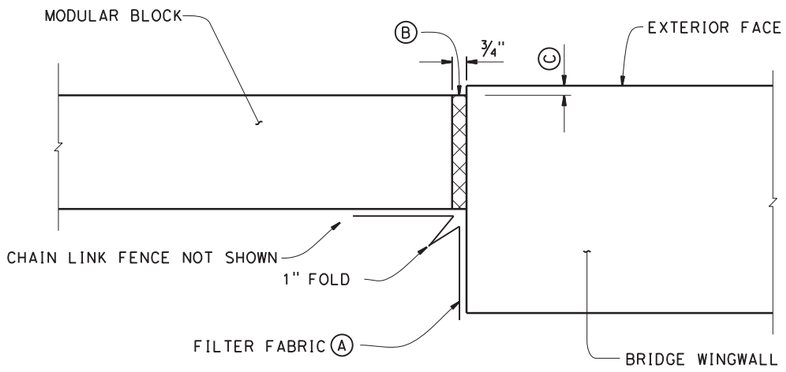

MODULAR BLOCK-TO-BRIDGE WINGWALL JOINT DETAIL

NO SCALE

NOTES:

Ⓐ Bond a strip of filter fabric, 1'-6" wide, to back of modular blocks and the adjacent concrete wall for entire length of vertical joint.

Ⓑ Bond expansion joint material to the concrete wall.

Ⓒ Offset between face of Modular Block Wall and face of the concrete wall to be zero at base of modular block wall and varies due to manufacturer recommended batter.

GENERAL NOTES: LOAD & RESISTANCE FACTOR DESIGN

DESIGN: AASHTO LRFD Bridge Design Specifications, 4th Edition with California Amendments

LIVE LOAD: Surcharge = 240 lb/ft^2

SOIL PARAMETERS:

Internal design ϕ = 34°, γ = 120 lb/ft^3

External design ϕ(Retained Backfill) = 30°, γ = 120 lb/ft^3

ϕ(Foundation) = 30°

K_h = 0.2

MODULAR BLOCK UNITS:

f'c = 4,000 psi (Concrete compressive strength at 28 days)

fy = 60,000 psi (Yield strength of reinforcement)

SOIL REINFORCEMENT:

Welded wire mats: fy = 65,000 psi (Yield strength)

Coupler: fy = 36,000 psi (Yield strength)

Corrosion rate = 1.1 mils/year

REINFORCED CONCRETE:

f'c = 3,600 psi, except as noted (Concrete compressive strength at 28 days)

fy = 60,000 psi (Yield strength of reinforcement)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
03	ED	BLAIRS LN			

100% SUBMITTAL

REGISTERED CIVIL ENGINEER DATE

REGISTERED PROFESSIONAL ENGINEER — Leland Mason — No. 62500 — Exp. 9/30/15 — CIVIL — STATE OF CALIFORNIA

PLANS APPROVAL DATE

The Identity or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

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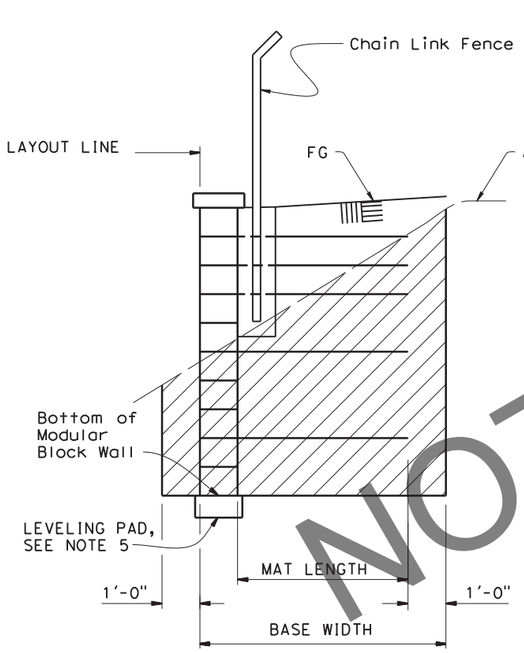
11017 Cobblerock Drive, Suite 100
Rancho Cordova, CA 95670

NOTES:

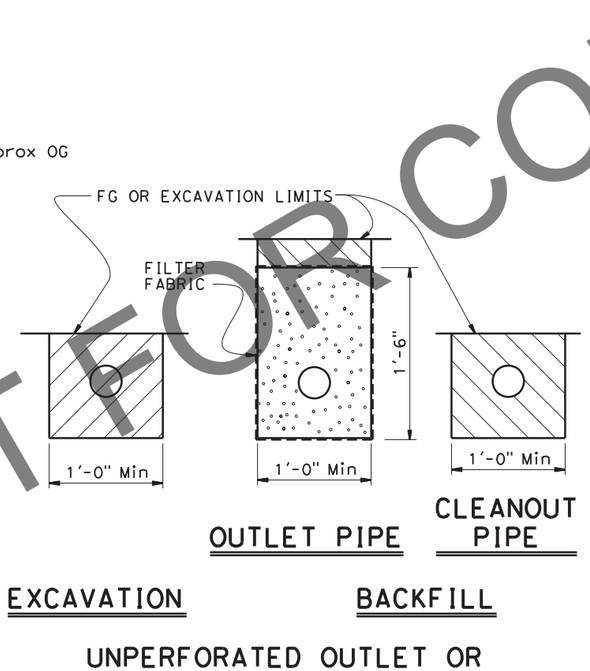
1. Locate underdrain at elevation needed to drain, as determined by the Engineer.
2. Place perforated pipe underdrain minimum 4" Dia smoothed wall PVC or corrugated HDPE.
3. Maximum spacing of outlet pipe is 50 feet.
4. Install separate drain systems, as required at excavation and geogrid exclusive zones as required to maintain drainage.
5. Leveling pad to be constructed of compacted crushed stone base or unreinforced concrete, as recommended by the manufacturer.
6. For Roadway Earthwork Pay Limits, see Road Quantities.

NOT FOR CONSTRUCTION



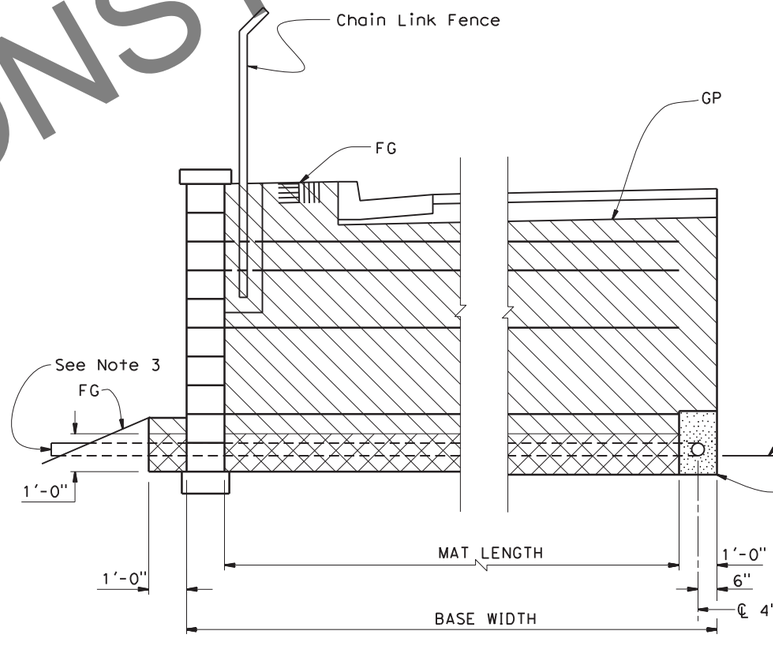
LIMITS OF EXCAVTION

NO SCALE



UNPERFORATED OUTLET OR CLEAN OUT PIPE FOR UNDERDRAIN

NO SCALE

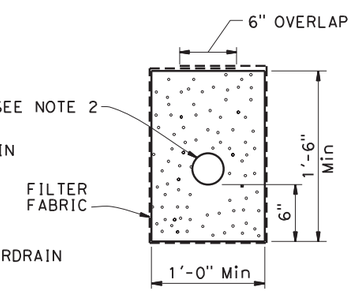


LIMITS OF BACKFILL: ROADWAY SECTION

NO SCALE

LEGEND:

- Limits of Structure Excavation (Modular Block Wall)
- Limits of Structure Backfill (Modular Block Wall)
- Limits of Permeable Material
- Limits of Class 2 Aggregate Base (Modular Block Wall)



UNDERDRAIN DETAIL

	BY	CHECKED
DESIGN	L. Mason	V. Doctolero
DETAILS	M. Ramirez	V. Doctolero
QUANTITIES	R. Kotey	M. Katt

PREPARED FOR THE CITY OF PLACERVILLE DEPARTMENT OF TRANSPORTATION

Leland Mason
PROJECT ENGINEER

BRIDGE NO.

POST MILE

RETAINING WALLS No. 2 & 4
DETAILS No. 2

DESIGN DETAIL SHEET (ENGLISH) (REV.03/14/12)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: X
PROJECT NUMBER & PHASE: X CONTRACT NO.: X

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
X				14	17

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DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
03	ED	BLAIRS LN			

100% SUBMITTAL
REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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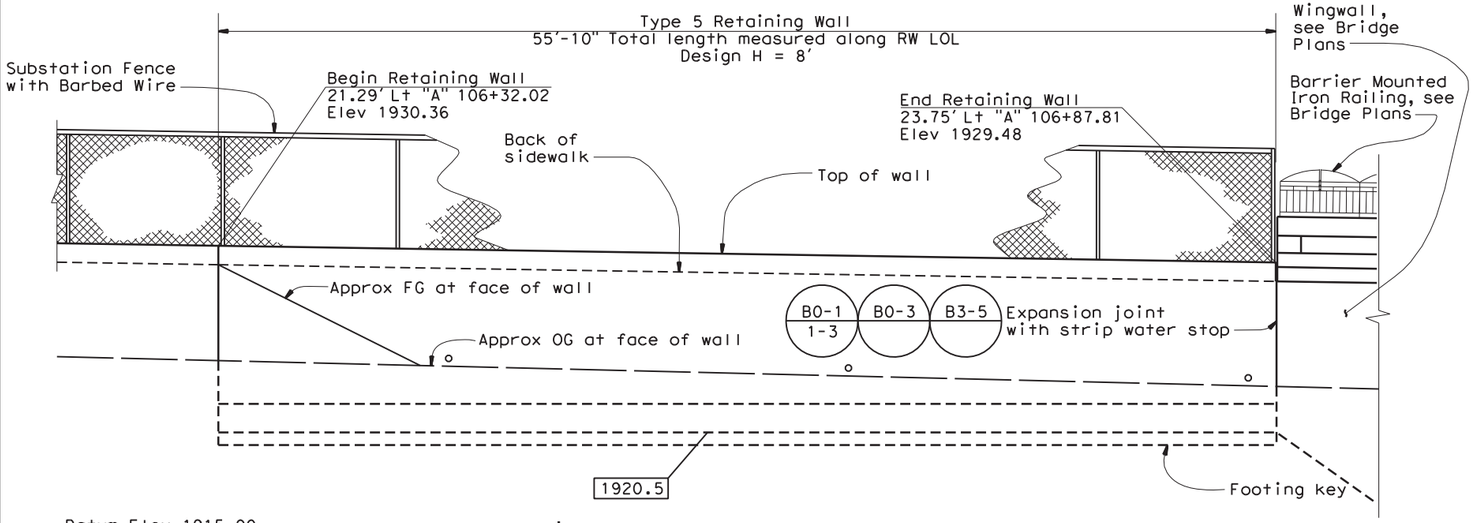
REGISTERED PROFESSIONAL ENGINEER — Leland Mason — No. 62500 — Exp. 9/30/15 — CIVIL — STATE OF CALIFORNIA

QUINCY ENGINEERING, INC
11017 Cobblerock Drive, Suite 100
Rancho Cordova, CA 95670

NOT FOR CONSTRUCTION



MIRROR ELEVATION

1/4"=1'-0"

Legend

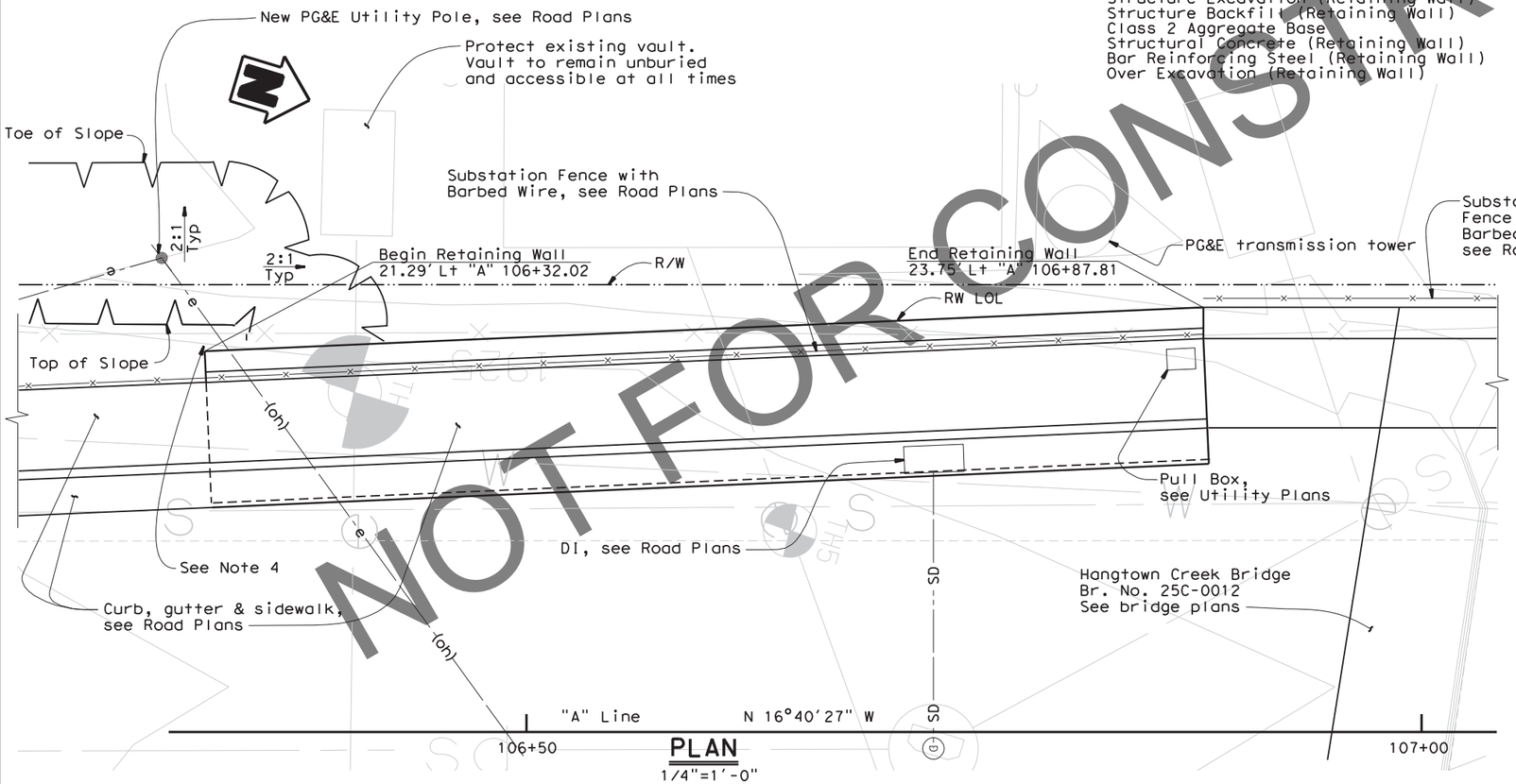
XXXX.X Bottom of footing elevation

Notes:

1. Existing water and sewer lines to be relocated, see Road Plans.
2. For Substation Fence details, see Road Plans.
3. For Roadway Earthwork Pay Limits, see Road Quantities.
4. Eliminate Over Excavation and Class 2 AB backfill beyond toe of Retaining Wall within 5-feet of utility pole.

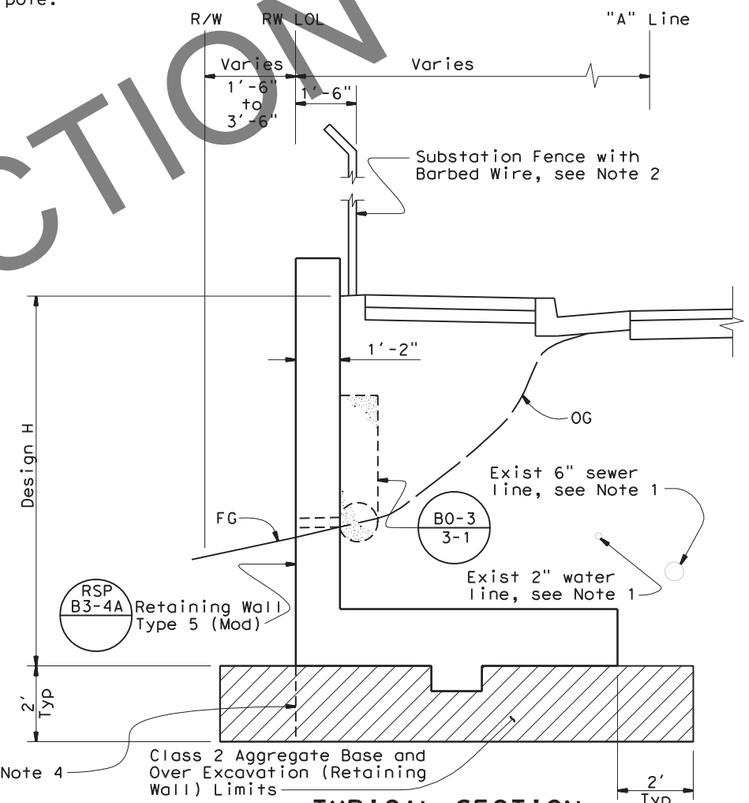
QUANTITIES

Structure Excavation (Retaining Wall)	102 CY
Structure Backfill (Retaining Wall)	146 CY
Class 2 Aggregate Base	52 CY
Structural Concrete (Retaining Wall)	48 CY
Bar Reinforcing Steel (Retaining Wall)	5149 LBS
Over Excavation (Retaining Wall)	52 CY



PLAN

1/4"=1'-0"



TYPICAL SECTION

1/2"=1'-0"

Rock elevation not shown, over excavation not required below bedrock

STANDARD PLANS DATED 2010

	A10A	Abbreviations (Sheet 1 of 2)
RSP	A10B	Abbreviations (Sheet 2 of 2)
	A10C	Symbols (Sheet 1 of 3)
	A10D	Symbols (Sheet 2 of 3)
	A10E	Symbols (Sheet 3 of 3)
	A62B	Limits of Payment for Excavation and Backfill Bridge Surcharge and Wall
	B0-1	Bridge Details
	B0-3	Bridge Details
RSP	B3-4A	Retaining Wall Type 5 (Case 1)
RSP	B3-5	Retaining Wall Details No. 1

STANDARD PLAN SHEET NO.

DETAIL NO.

DESIGN	BY L. Mason	CHECKED J. Quincy	LOAD AND RESISTANCE FACTOR DESIGN	LIVE LOADING: HL93 WITH "LOW BOY" AND PERMIT DESIGN LOAD		PREPARED FOR THE CITY OF PLACERVILLE DEPARTMENT OF TRANSPORTATION	Leland Mason PROJECT ENGINEER
DETAILS	BY L. Mason	CHECKED J. Quincy	LAYOUT	BY L. Mason	CHECKED J. Quincy		
QUANTITIES	BY R. Kotey	CHECKED M. Katt	SPECIFICATIONS	BY K. Gallagher	PLANS AND SPECS COMPARED		

BRIDGE NO.

POST MILES

RETAINING WALL No. 3
GENERAL PLAN

DESIGN GENERAL PLAN SHEET (ENGLISH) (REV.5/9/00)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

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DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 15 OF 17

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DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
03	ED	BLAIRS LN			

100% SUBMITTAL

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Leland Mason — No. 62500 — Exp. 9/30/15 — CIVIL — STATE OF CALIFORNIA

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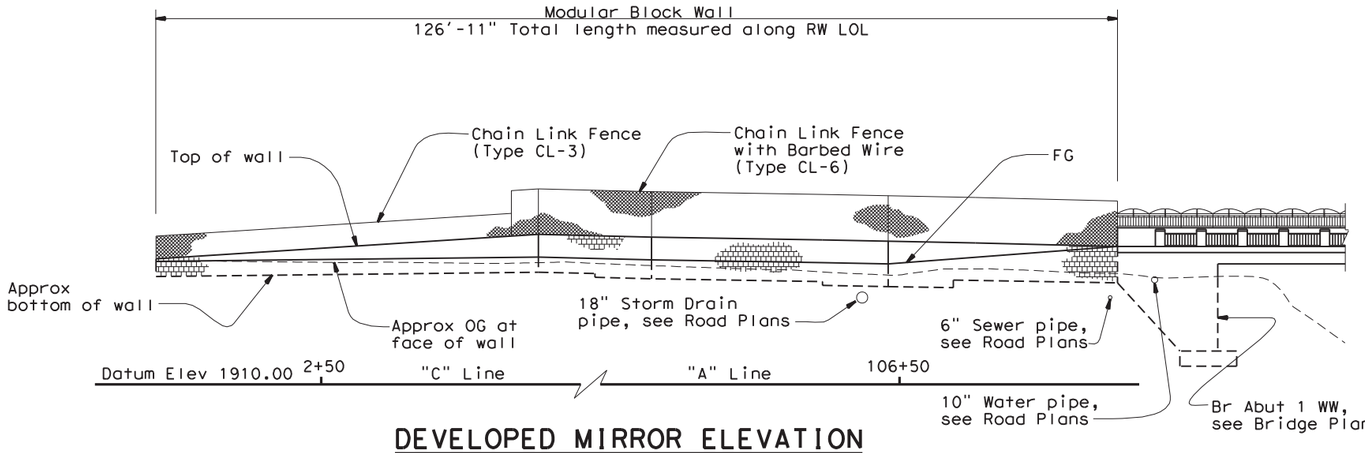
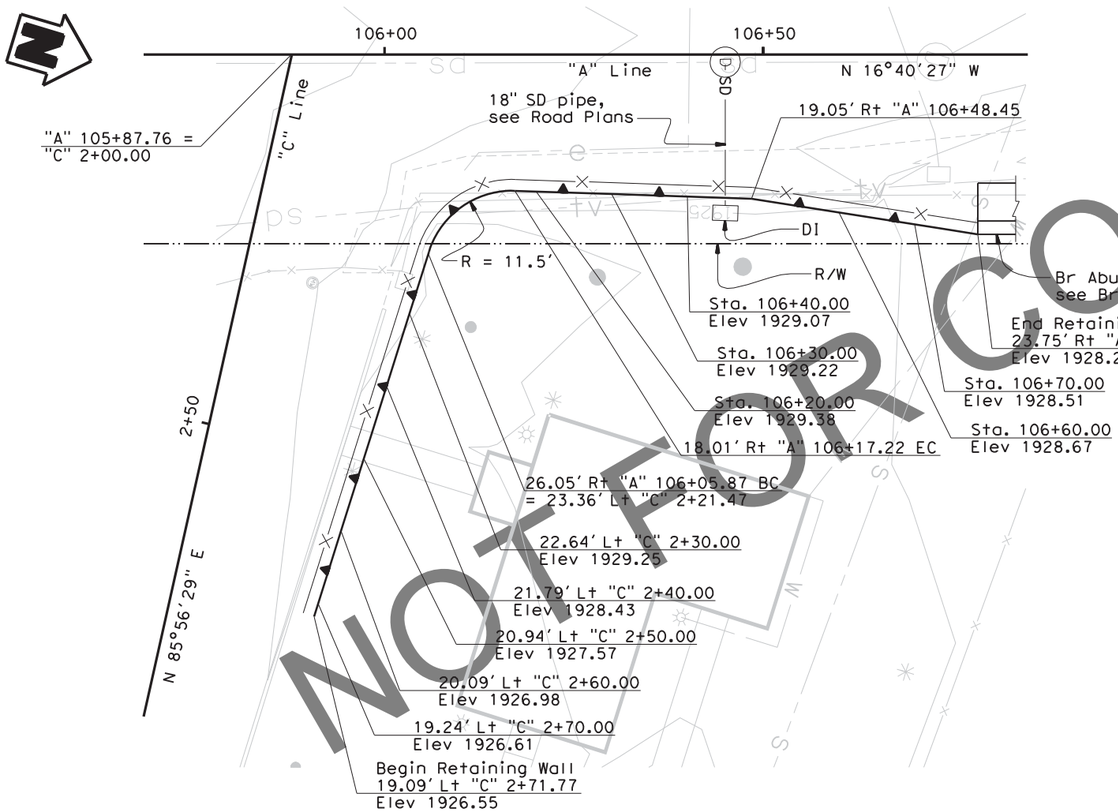


DEVELOPED MIRROR ELEVATION

1"= 10'

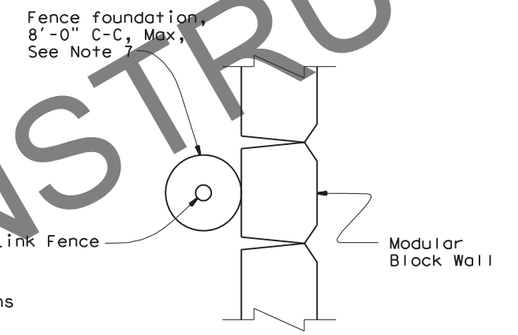
Notes:

1. Layout line shown represents top outside face of wall.
2. For limits of Chain Link Fence, see Road Plans.
3. Various trees to remain, see Road Plans.
4. Contractor shall relocate irrigation.
5. Modify post spacing to avoid drainage inlet locations.
6. For drainage inlet locations see Drainage Plans.
7. Concrete filled tube or other manufacturer recommended fence foundation. Foundation tube or other blockout to be set during the wall construction, not cut through geogrid afterwards when directly behind units.
8. For Design Notes and details not shown, see Retaining Walls No. 2 & 4 Details No. 1 and Retaining Walls No. 2 & 4 Details No. 2 sheets.
9. For Roadway Earthwork Pay Limits, see Road Quantities.



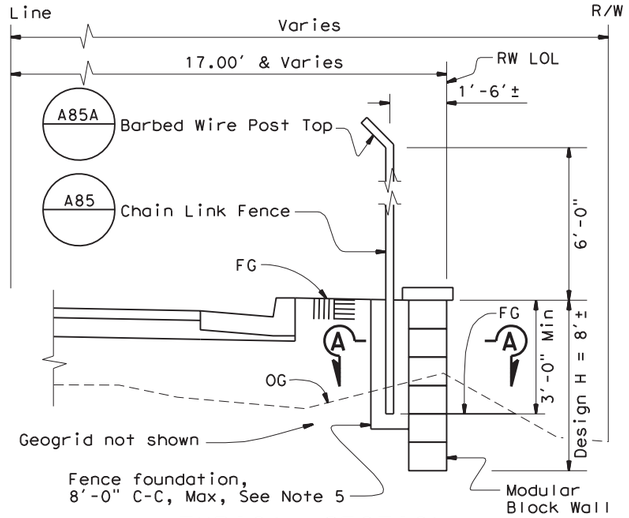
PLAN

1"= 10'



SECTION A-A

1"=1'-0"



TYPICAL SECTION

1/2"=1'-0"

QUANTITIES

Modular Block Wall	1016 SF
* Structure Excavation (Modular Block Wall)	190 CY
* Structure Backfill (Modular Block Wall)	260 CY
* Class 2 Aggregate Base (Modular Block Wall)	10 CY
* Permeable Material (Modular Block Wall)	50 CY

* Denotes informational quantity. Payment is included in Modular Block Wall. Estimated quantities assume minimum wall embedment of 2.0 ft below FG at outside face of wall, a design wall height of 8.0 ft, and a base width of 10 ft. These quantities are provided to the Contractor as a courtesy and are for information purposes only. The actual modular block wall system selected by the Contractor may be different and will determine the actual quantities required for the work.

STANDARD PLANS DATED 2010

	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)
	A62B	Limits of Payment for Excavation and Backfill Bridge Surcharge and Wall
	A85	Chain Link Fence
	A85A	Chain Link Fence Details

STANDARD PLAN SHEET NO.

DETAIL NO.

NOT FOR CONSTRUCTION

DESIGN	BY M. Ruble	CHECKED V. Doctolero	LOAD AND RESISTANCE FACTOR DESIGN	LIVE LOADING: HL93 WITH "LOW BOY" AND PERMIT DESIGN LOAD		PREPARED FOR THE CITY OF PLACERVILLE DEPARTMENT OF TRANSPORTATION	Leland Mason PROJECT ENGINEER
DETAILS	BY M. Ruble	CHECKED V. Doctolero	LAYOUT	BY M. Ruble	CHECKED V. Doctolero		
QUANTITIES	BY R. Kotey	CHECKED M. Katt	SPECIFICATIONS	BY K. Gallagher	PLANS AND SPECS COMPARED		

BRIDGE NO.

POST MILES

RETAINING WALL No. 4

GENERAL PLAN

DESIGN GENERAL PLAN SHEET (ENGLISH) (REV.5/9/00)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

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DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 16 OF 17

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DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
03	ELD				

REGISTERED ENGINEERING GEOLOGIST

01/14/2014
PLANS APPROVAL DATE

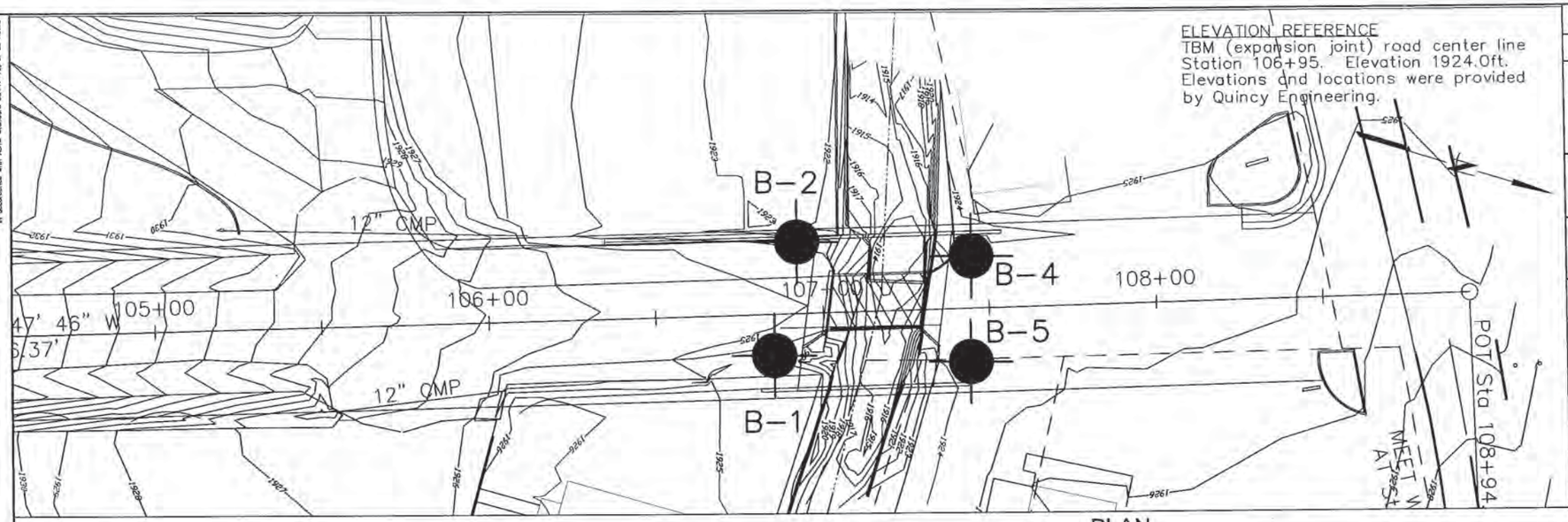
REGISTERED GEOLOGIST DAVID A. KITZMANN No. 2412 CERTIFIED ENGINEERING GEOLOGIST STATE OF CALIFORNIA

TABER CONSULTANTS
3911 West Capitol Avenue
West Sacramento, CA 95691-2116

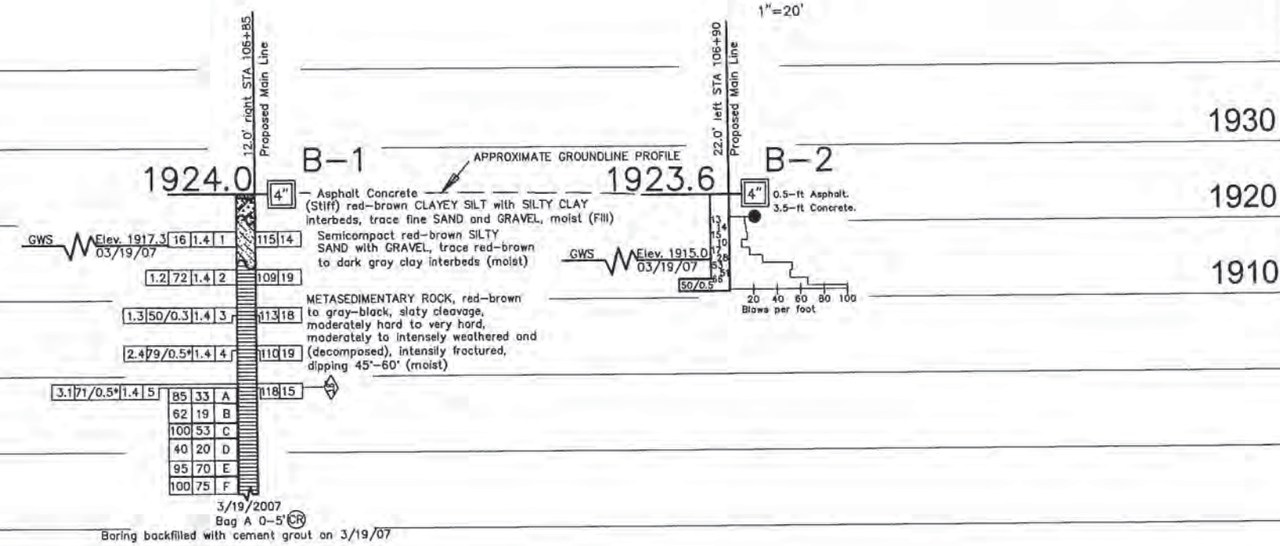
JOB No. 1P2/304/175 LOCATION: 38120-F7: 36BN: 175W

QUINCY ENGINEERING, INC.
11017 Cobblerock Drive, Suite 100
Rancho Cordova, California 95670
(916) 368-9181

ELEVATION REFERENCE
TBM (expansion joint) road center line Station 106+95. Elevation 1924.0ft. Elevations and locations were provided by Quincy Engineering.



PLAN
1"=20'



PROFILE
VERT. 1"=10'
HORT. Not to Scale

NOTES:
1. Field classification of soils was in accordance with ASTM D 2488-10 "Description and Identification of Soils (Visual-Manual Procedure)".

2. Standard Penetration tests were performed in accordance with ASTM D 1586-10 using a hammer operated with an automated drop system. Drill rods were 1 5/8-inch diameter "A"-rods; sampler was driven with brass liners.

3. The length of each sampled interval is shown graphically on the boring log. Whole number blow counts ("N") represent the "standard penetration resistance" interval in accordance with ASTM D1586-10. Where less than 1 foot of penetration is achieved, the blow count shown is for that fraction of the "standard penetration resistance" interval actually penetrated.

4. Rock classification according to Bureau of Reclamation, U.S. Department of the Interior (USBR), "Engineering Geology Field Manual", and "Manual of Field Geology"; (Compton, Robert R.). USBR field descriptor sheet is attached. Rock Quality Designation (RQD), Weathering, Rock Hardness/Strength, Bedding, and Fracture Density, as shown on this sheet, were used to describe all rock core from borings -1, and -2, drilled in 2007. Descriptors were determined in the field. REC = Core Recovered (percent). RQD = Rock Quality Designation (percent).

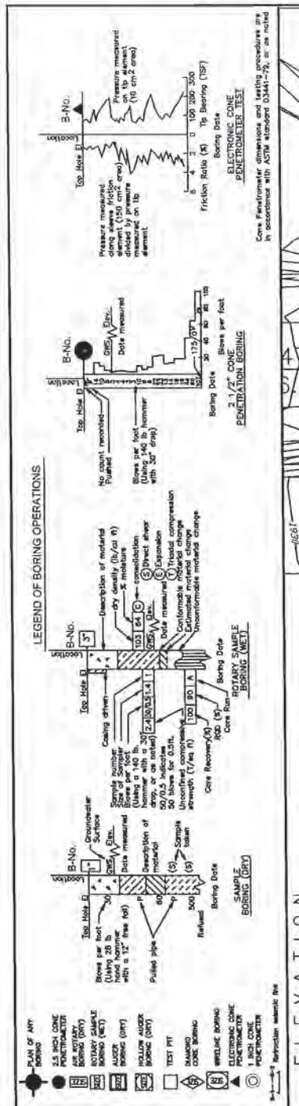
5. Where indicated by an asterisk (*) the number of blows shown is for only that fraction of the initial 0.5 ft. "seating drive" interval penetrated.

6. Consistency of soils shown in ( ) where estimated.

7. Groundwater surface (GWS) elevations in the borings indicated on the Log of Test Boring Sheets reflect the fluid level in the borings on the specified date.

8. Groundwater surface elevations are subject to seasonal fluctuations and may occur at higher or lower elevations depending on the conditions at any particular time.

9. Boring elevations surveyed in the field by Taber personnel on 03/20/2007 are tied into project datum provided by Quincy Engineering



DESIGN OVERSIGHT	DRAWN BY	X. NGUYEN	EVAN HOPSON FIELD INVESTIGATOR	PREPARED FOR CITY OF PLACERVILLE DEPARTMENT OF TRANSPORTATION	PROJECT ENGINEER	BRIDGE NO.	HANGTOWN CREEK BRIDGE
SIGN OFF DATE	CHECKED BY	DAVE KITZMANN	DATE MARCH 2007			POST MILE	LOG OF TEST BORINGS

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU EA

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 1 OF 2

01/14/2014 1P2304175a.dwg

DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
03	ELD				

REGISTERED ENGINEERING GEOLOGIST

01/14/2014
PLANS APPROVAL DATE

REGISTERED GEOLOGIST DAVID A. KITZMANN No. 2412 CERTIFIED ENGINEERING GEOLOGIST STATE OF CALIFORNIA

TABER CONSULTANTS
3911 West Capitol Avenue
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JOB No. 1P2/304/175 LOCATION: 38120-F7: 368N: 175W

QUINCY ENGINEERING, INC.
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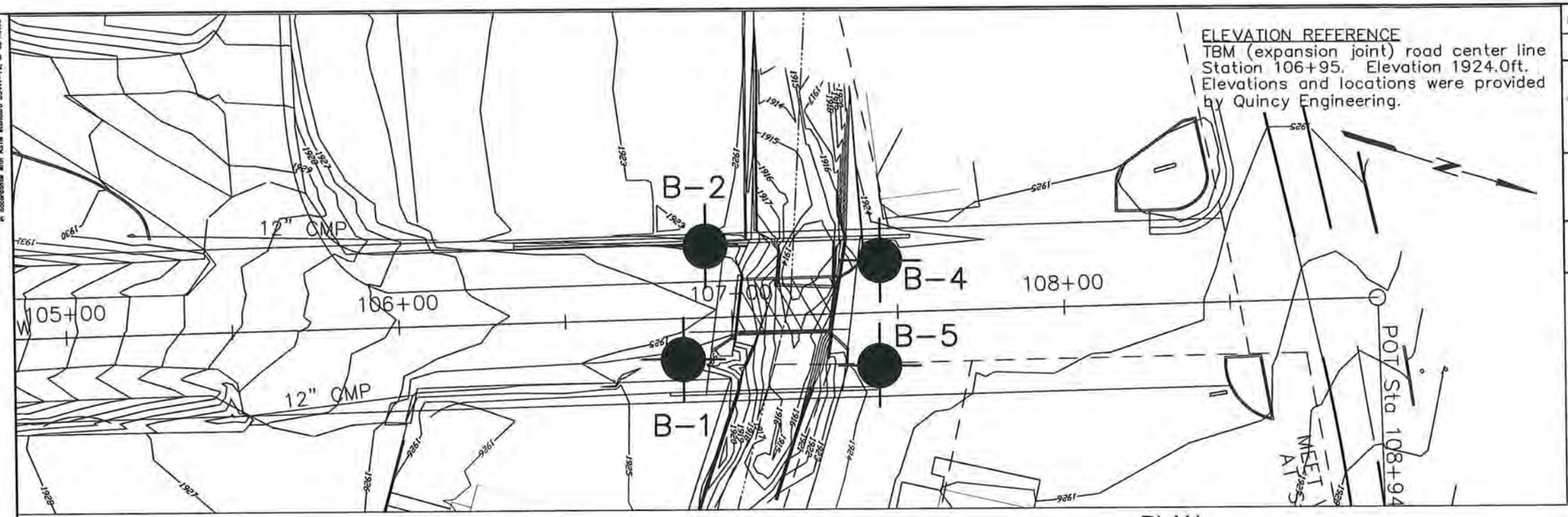
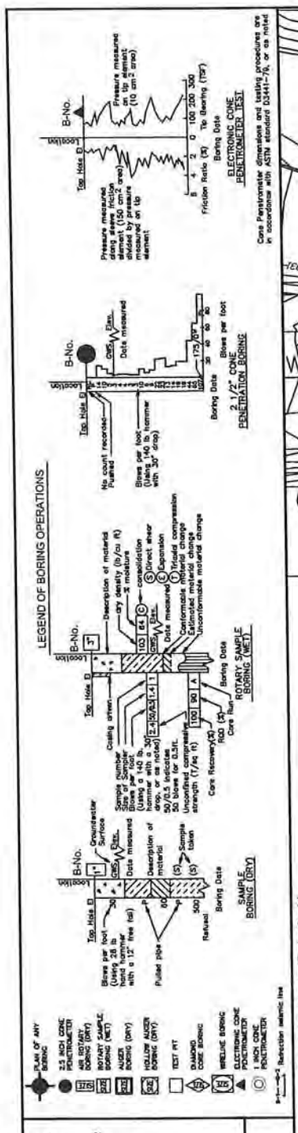
ELEVATION REFERENCE
TBM (expansion joint) road center line Station 106+95. Elevation 1924.0ft. Elevations and locations were provided by Quincy Engineering.



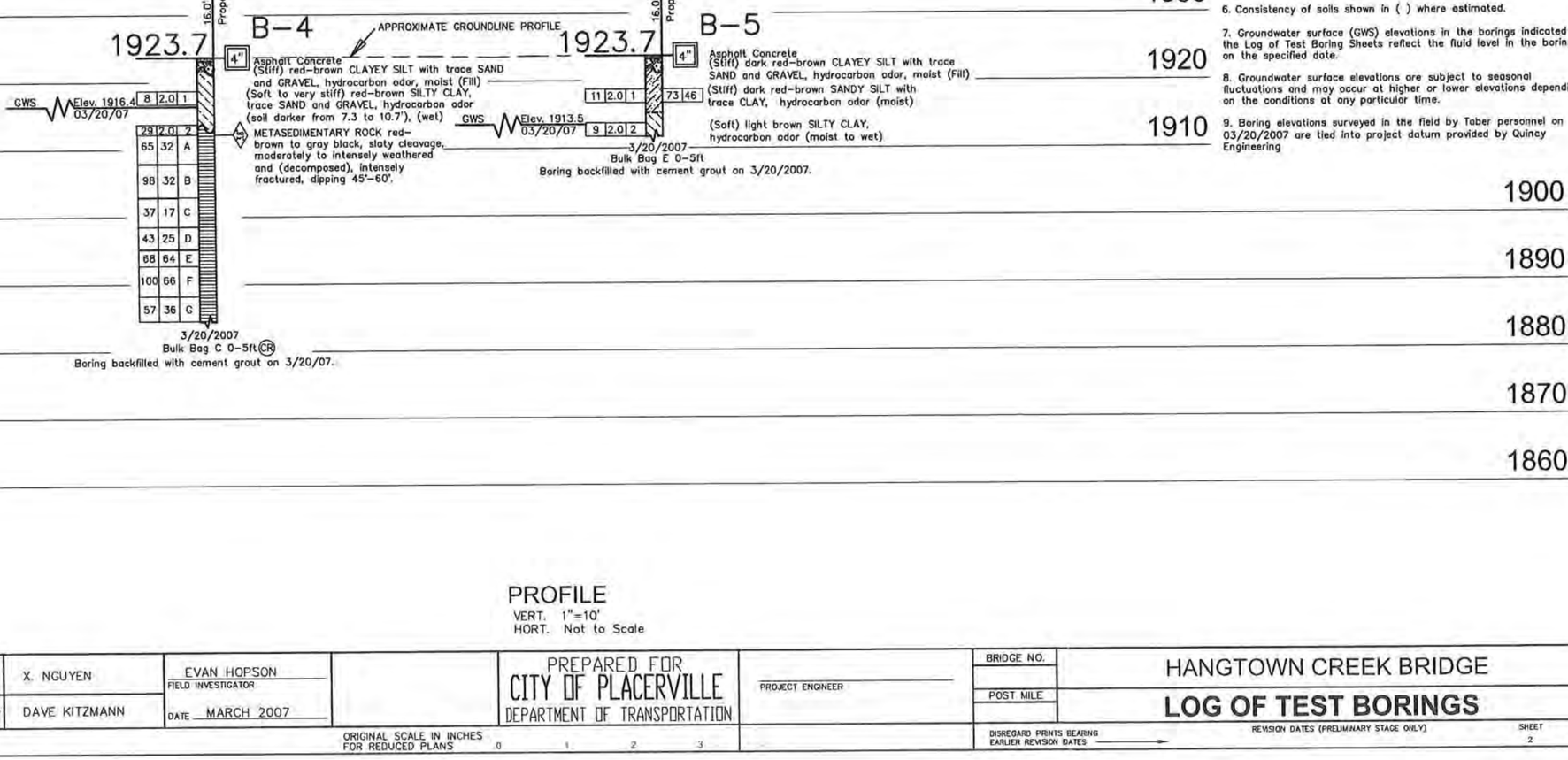
PLAN
1"=20'



CONSISTENCY CLASSIFICATION FOR SOILS
According to the Standard Penetration Test

Standard Penetration "N"-Value	Granular	Cohesive
0-5	Very loose	Very soft
6-10	Loose	Soft
11-20	Semi-compact	Stiff
21-35	Compact	Very stiff
36-70	Dense	Hard
>70	Very dense	Very hard

NOTE: Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.



PROFILE
VERT. 1"=10'
HORT. Not to Scale

NOTES:
1. Field classification of soils was in accordance with ASTM D 2488-10 "Description and Identification of Soils (Visual-Manual Procedure)".

2. Standard Penetration tests were performed in accordance with ASTM D 1586-10 using a hammer operated with an automated drop system. Drill rods were 1 5/8-inch diameter "A"-rods; sampler was driven with brass liners.

3. The length of each sampled interval is shown graphically on the boring log. Whole number blow counts ("N") represent the "standard penetration resistance" interval in accordance with ASTM D1586-10. Where less than 1 foot of penetration is achieved, the blow count shown is for that fraction of the "standard penetration resistance" interval actually penetrated.

4. Rock classification according to Bureau of Reclamation, U.S. Department of the Interior (USBR), 'Engineering Geology Field Manual'; and 'Manual of Field Geology'; (Compton, Robert R.). USBR field descriptor sheet is attached. Rock Quality Designation (RQD), Weathering, Rock Hardness/Strength, Bedding, and Fracture Density, as shown on this sheet, were used to describe all rock core from borings -1, and -2, drilled in 2007. Descriptors were determined in the field. REC = Core Recovered (percent). RQD = Rock Quality Designation (percent).

5. Where indicated by an asterisk (*) the number of blows shown is for only that fraction of the initial 0.5 ft. "seating drive" interval penetrated.

6. Consistency of soils shown in ( ) where estimated.

7. Groundwater surface (GWS) elevations in the borings indicated on the Log of Test Boring Sheets reflect the fluid level in the borings on the specified date.

8. Groundwater surface elevations are subject to seasonal fluctuations and may occur at higher or lower elevations depending on the conditions at any particular time.

9. Boring elevations surveyed in the field by Taber personnel on 03/20/2007 are tied into project datum provided by Quincy Engineering

DESIGN OVERSIGHT	DRAWN BY	X. NGUYEN	EVAN HOPSON FIELD INVESTIGATOR	PREPARED FOR CITY OF PLACERVILLE DEPARTMENT OF TRANSPORTATION	PROJECT ENGINEER
SIGN OFF DATE	CHECKED BY	DAVE KITZMANN	DATE MARCH 2007		

BRIDGE NO.	HANGTOWN CREEK BRIDGE
POST MILE	**LOG OF TEST BORINGS**

01/14/2014 1P2304175 Updated_LOTB BlairsLane_032707.dwg

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 2 OF 2

ATTACHMENT F

100% SPECIAL PROVISIONS – NOT FOR CONSTRUCTION

ATTACHMENT F - 100% SPECIAL PROVISIONS

CITY OF PLACERVILLE
DIVISION OF ENGINEERING

NOTICE TO BIDDERS AND SPECIAL PROVISIONS, PROPOSAL AND CONTRACT

FOR

BLAIRS LANE BRIDGE REPLACEMENT PROJECT

FEDERAL AID PROJECT NO. BHLO 5015 (009)

IN
EL DORADO COUNTY

CONTRACT NO. 40604

NOT FOR CONSTRUCTION

Book dated April 9, 2015 — *Standard Specifications* dated 2010

Project plans approved April X, 2015 — *Standard Plans* dated 2010

BID OPENING: Tuesday, May 12, 2015 at 2:00 p.m.

Location: City Hall
3101 Center Street
Placerville, CA 95667

NOT FOR CONSTRUCTION

SPECIAL NOTICES

- See sections 2 and 3 for contractors' registration requirements.
- DBE requirements have been revised. See sections 2, 3, and 5 and DBE forms in the Proposal section for the revised requirements.

NOT FOR CONSTRUCTION

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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)**

PAVEMENT MARKERS, TRAFFIC LINES, AND PAVEMENT MARKINGS

A20A	**Pavement Markers and Traffic Lines, Typical Details**
A20B	**Pavement Markers and Traffic Lines, Typical Details**
RSP A24A	**Pavement Markings - Arrows**
RSP A24E	**Pavement Markings - Words, Limit and Yield Lines**

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**
A62F	**Excavation and Backfill - Metal and Plastic Culverts**

OBJECT MARKERS, DELINEATORS, CHANNELIZERS AND BARRICADES

A73A	**Object Markers**
A73C	**Delineators, Channelizers and Barricades**

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**

DRAINAGE INLETS, PIPE INLETS AND GRATES

RSP D73	**Drainage Inlets**
D74A	**Drainage Inlets**
RSP D77B	**Grate Details No. 2**

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**
D97C	**Corrugated Metal Pipe Coupling Details No. 3 - Helical and Universal Couplers**
D97D	**Corrugated Metal Pipe Coupling Details No. 4 - Hugger Coupling Bands**
D97E	**Corrugated Metal Pipe Coupling Details No. 5 - Standard Joint**
D97F	**Corrugated Metal Pipe Coupling Details No. 6 - Positive Joint**

TEMPORARY CRASH CUSHIONS, RAILING AND TRAFFIC SCREEN

T1A	**Temporary Crash Cushion, Sand Filled (Unidirectional)**
T1B	**Temporary Crash Cushion, Sand Filled (Bidirectional)**

NOT FOR CONSTRUCTION

T2	Temporary Crash Cushion, Sand Filled (Shoulder Installations)
T3A	Temporary Railing (Type K)
T3B	Temporary Railing (Type K)
	TEMPORARY TRAFFIC CONTROL SYSTEMS
RSP T13	Traffic Control System for Lane Closure on Two Lane Conventional Highways
RSP T17	Traffic Control System for Moving Lane Closure on Two Lane Highways
T51	Temporary Water Pollution Control Details (Temporary Silt Fence)
T56	Temporary Water Pollution Control Details (Temporary Fiber Roll)
T58	Temporary Water Pollution Control Details (Temporary Construction Entrance)
T59	Temporary Water Pollution Control Details (Temporary Concrete Washout Facility)
T61	Temporary Water Pollution Control Details (Temporary Drainage Inlet Protection)
T62	Temporary Water Pollution Control Details (Temporary Drainage Inlet Protection)
T63	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)]
	BRIDGE DETAILS
B0-1	Bridge Details
B0-3	Bridge Details
B0-5	Bridge Details
B0-13	Bridge Details
	RETAINING WALLS
RSP B3-4A	Retaining Wall Type 5 (Case 1)
RSP B3-5	Retaining Wall Details No. 1
	JOINT SEALS
B6-21	Joint Seals (Maximum Movement Rating = 2")
	CAST-IN-PLACE POST-TENSIONED GIRDER
RSP B8-5	Cast-In-Place Post-Tensioned Girder Details
	BRIDGE CONCRETE BARRIERS
RSP B11-62	Concrete Barrier Type 80SW (Sheet 1 of 3)
B11-63	Concrete Barrier Type 80SW (Sheet 2 of 3)
B11-64	Concrete Barrier Type 80SW (Sheet 3 of 3)
	ROADSIDE SIGNS
RS1	Roadside Signs, Typical Installation Details No. 1
RS2	Roadside Signs - Wood Post, Typical Installation Details No. 2
RS4	Roadside Signs, Typical Installation Details No. 4
	OVERHEAD AND ROADSIDE SIGNS PANELS
S94	Roadside Framed Single Sheet Aluminum Signs, Rectangular Shape
	ELECTRICAL SYSTEMS - PULL BOX
RSP ES-8A	Electrical Systems (Non-Traffic Pull Box)

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NOT FOR CONSTRUCTION

CITY OF PLACERVILLE

ENGINEERING DIVISION

NOTICE TO BIDDERS

Bids open Tuesday, May 12, 2015

General work description: Construct single span cast-in-place pre-stressed concrete slab bridge and the reconstruction of approximately 500 feet of roadway with new sidewalk. You must perform, place, construct, or install other items and details not mentioned that are required of the plans under the Standard Specifications and special provisions.

The City will receive sealed bids for BLAIRS LANE BRIDGE REPLACEMENT PROJECT

Contract Number: 40604

Contract Documents and Plans may be examined at the City of Placerville Engineering Division, 3101 Center Street, 3rd floor, Placerville, CA 95667.

The Contract Documents and Plans may be previewed and downloaded from http://CityOfPlacerville.org and clicking on the "Projects out to Bid" Button or by visiting http://www.QuestCDN.com and entering eBidDoc # 3094526. Contact QuestCDN.com (925) 233-1632 or info@questcdn.com for assistance with free membership registration and downloading and working with this digital project information.

In order to submit a bid on this project, the digital contract documents must be purchased for a cost of $100.00 through QuestCDN. This places you on the planholders list and ensures receipt of addenda by email from QuestCDN.com. Only bidders on the planholders list may submit a bid.

You are responsible for printing and binding the bid documents from the digital format before submitting the bid.

The Contract Documents may be purchased from QuestCDN.com.

Bid forms for this work are included in the Proposal Section of this book.

The Contractor must have either a Class A license or a combination of class C licenses that make up a majority of the work.

The Contractor must comply with all of the requirements of the City Business License Ordinance, where applicable, before beginning work and through Contract Acceptance.

The DBE Contract goal is Three (3%) percent.

Federal-aid project No.: BHLO 5015 (009)

For the federal training program, the number of trainees or apprentices is 1.

Bids must be on a unit price basis.

Complete the work, excluding plant establishment work, within 205 working days. Complete plant establishment work within 3 years, starting at the end of the working days.

The estimated cost of construction is $2,900,000.

A pre-bid meeting is scheduled for 10:00 a.m. on Tuesday, April 21, 2015, at the Placerville Engineering Division, 3101 Center Street, Placerville, CA 95667. The meeting will be held in the 3rd floor Conference room. Attendance at the pre-bid meeting is NOT mandatory.

NOT FOR CONSTRUCTION

The City Clerk will receive sealed bids until 2:00 p.m. on the bid open date at City Hall, 3rd floor, 3101 Center Street, Placerville, California. Bids received after this time will not be accepted.

Bid proposals shall be sealed in an envelope plainly marked "BID PROPOSAL FOR BLAIRS LANE BRIDGE REPLACEMENT PROJECT, CONTRACT NO. 40604", on the outside. Bids will only be accepted from registered plan holders. Bids not properly marked will be considered nonresponsive.

The City will immediately open and publicly read the bids at the mentioned location after the specified closing time.

All communication relative to the Contract Documents must be directed to Rebecca Neves at the City of Placerville Engineering Division, 3101 Center Street, Placerville, CA 95667, Telephone (530) 642-5250. No oral responses to any questions concerning the content of the Plans and Contract Documents will be given. All responses will be in the form of written addenda to the Contract Documents and Plans.

Inquiries or questions about alleged patent ambiguity of the plans, specifications, or estimate must be submitted as a bidder inquiry before bid opening. Bid inquires must be received by 4:00 PM on fourth (4th) business day before bid opening. After this time, the City will not consider these questions as bid protests.

Submit your bid with bidder's security equal to at least ten percent (10%) of the bid.

If you are awarded a contract, you will be required to furnish the City with a payment bond equal to 100% of the total bid and a performance bond equal to 100% of the total bid.

You must take necessary and reasonable steps to ensure that DBEs have opportunity to participate in the Contract (49 CFR 26).

Prevailing wages are required on this Contract. The Director of the California Department of Industrial Relations determines the general prevailing wage rates. Obtain the wage rates at the DIR Web site, http://www.dir.ca.gov/DLSR/PWD, or from the City's Department of Transportation.

The federal minimum wage rates for this Contract as determined by the United States Secretary of Labor are included and are available at http://www.wdol.gov/dba.aspx.

If the minimum wage rates as determined by the United States Secretary of Labor differs from the general prevailing wage rates determined by the Director of the California Department of Industrial Relations for similar classifications of labor, you and your subcontractors must not pay less than the higher wage rate. The City does not accept lower State wage rates not specifically included in the federal 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 you and your subcontractors, you and your subcontractors must pay not less than the Federal minimum wage rate that most closely approximates the duties of the employees in question.

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.

California Department of Transportation has made available Notices if Suspension and Proposed Debarment from the Federal Highway Administration. For a copy of the notices, go to http://www.dot.ca.gov/hq/esd/oe/contractor_info. Additional information is provided in the Excluded Parties List System at http://www.epls.gov.

NOT FOR CONSTRUCTION

Prepared By: _____

Rebecca Neves, P.E. Date
City Engineer

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*.

^^

Replace Division 1 (sections 1 thru 9) with the following:

DIVISION I GENERAL PROVISIONS

1 GENERAL

1-1.01 GENERAL

Complete the contract work under the California Department of Transportation Standard Specifications, dated 2010 and these special provisions.

Section 1 includes general rules of interpretation.

The specifications are divided into 11 divisions.

Division I includes general specifications applicable to every contract unless specified as applicable under certain conditions.

Division II includes specifications for general construction applicable to every contract unless specified as applicable under certain conditions.

Divisions III through IX include construction specifications for specific bid items.

Division X includes specifications for common materials. For a material specified in this division, that material specified in any section must comply with the specifications in division X.

Division XI includes construction specifications for buildings.

The bid items set forth the construction specifications that apply. The first 2 digits of a bid item code correspond to the specification section number with the same 2 first digits except for bid item code 999990 that corresponds to section 9 and unless shown otherwise in the table titled "Bid Items and Applicable Sections" in the special provisions.

The specifications are written to the Bidder before award and the Contractor after. Before award, interpret sentences written in the imperative mood as starting with "The Bidder must" and interpret "you" as "the Bidder" and "your" as "the Bidder's." After award, interpret sentences written in the imperative mood as starting with "The Contractor must" and interpret "you" as "the Contractor" and "your" as "the Contractor's."

After Contract approval, submit documents and direct questions to the Engineer. Orders, authorizations, and requests to the Contractor are by the Engineer.

The following items from the Department are in writing:

NOT FOR CONSTRUCTION

1. Approvals
2. Authorizations
3. Decisions
4. Notifications
5. Orders
6. Responses

The following items from the Contractor must be in writing:

1. Assignments
2. Notifications
3. Proposals
4. Reports
5. Requests, including RFIs, sequentially numbered
6. Subcontracts
7. Test results

Where a location is not specified with the words "shown "specified or "described," interpret:

1. "Shown" as "shown on the plans."
2. "Specified" as "specified in the specifications."
3. "Described" as "described in the Contract." "Described" means "shown, specified, or both."

Headings are included for the purposes of organization and referencing. Inclusion of a heading with no related content, "Not Used," or "Reserved" does not indicate that no specification exists for that subject; applicable specifications may be covered in a general or referenced specification.

Sections are reserved in the *Standard Specifications* for correlation of special provisions and revised standard specifications with the *Standard Specifications* and for future expansion of the *Standard Specifications*.

The specifications are expressed in U.S. customary units except where a referenced document uses the International System of Units as the standard.

Unless an object or activity is specified to be less than the total, the quantity or amount is all of the object or activity.

All items in a list apply unless the items are specified as choices.

NOT FOR CONSTRUCTION

1-1.02 STYLE VARIATIONS

The Department is gradually standardizing the style of the specifications. The use of the new style does not change the meaning of a Contract part not using this style. The new style includes:

1. Use of:
   1.1. Imperative mood
   1.2. Introductory modifiers
   1.3. Conditional clauses
   1.4. Industry-standard terms
2. Elimination of:
   2.1. Language variations
   2.2. Definitions for industry-standard terms
   2.3. Redundant specifications
   2.4. Needless cross-references

Because of the transition, some terms or clauses used in Division I are different from those used in other divisions and in other Contract parts. Interpret the equivalent term or clause shown in the following table as having the same meaning as the corresponding term or clause in Division I:

Terms Equivalencies

Term or clause in Division I	Equivalent term or phrase that may be in other divisions and in other Contract parts	Conditions
Authorize	Approve	Except in a *Change Order*
Authorized Material List	Pre-Qualified Products List	--
Department	Engineer	Where referring to anyone other than the Resident Engineer or the Resident Engineer's authorized representatives
Department-furnished material	State-furnished material	--
<work description> is change order work	<work description> will be paid for as extra work <with or without a reference to a section>	--

1-1.03–1-1.04 RESERVED

1-1.05 REFERENCES

A reference within parentheses to a law or regulation is included in the Contract for convenience only and is not a comprehensive listing of related laws and regulations. Lack of a reference does not indicate no related laws or regulations exist.

Where the version of a referenced document is not specified, use the most recent version in effect on the date of the *Notice to Bidders*.

A reference to a section includes the general specifications for the section.

Where a section number is referenced without a reference to a document, the reference is to a section of the *Standard Specifications* as revised by any revised standard specification, special provision, or both. Any reference directly to a revised standard specification section is for convenience only. Lack of a direct reference to a revised standard specification section does not indicate a revised standard specification for the section does not exist.

A code not specified as a federal code is a California code.

A department not specified as a federal or local department is a California department.

NOT FOR CONSTRUCTION

1-1.06 ABBREVIATIONS

Interpret the meaning of an abbreviation used in the specifications and the Bid Item List as shown in the following table:

Abbreviations

Abbreviation	Meaning
AASHTO	American Association of State Highway and Transportation Officials
AB	aggregate base
ACI	American Concrete Institute
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AMA	archaeological monitoring area
ANSI	American National Standards Institute
API	American Petroleum Institute
AREMA	American Railway Engineering and Maintenance-of-Way Association
AS	aggregate subbase
ASME	American Society of Mechanical Engineers
ASQ	American Society for Quality
ATPB	asphalt treated permeable base
AWG	American Wire Gauge
AWPA	American Wood Protection Association
AWS	American Welding Society[a]
AWWA	American Water Works Association
BBS	battery backup system
BNSF	Burlington Northern Santa Fe
Cal/OSHA	California Division of Occupational Safety and Health Administration
CBC	California Building Code
CDPH	California Department of Public Health
CIDH	cast-in-drilled-hole
CIH	Certified Industrial Hygienist
CIP	cast in place
CJP	complete joint penetration
CMU	concrete masonry unit
CPM	critical path method
CPL	composite plastic lumber
CRCP	continuously reinforced concrete pavement
CRM	crumb rubber modifier
CTB	cement treated base
CTPB	cement treated permeable base
CVN	Charpy V-notch
CWI	AWS Certified Welding Inspector
DBE	Disadvantaged Business Enterprise
DRA	Dispute Resolution Advisor
DRB	Dispute Resolution Board
DTSC	Department of Toxic Substances Control
DVBE	Disabled Veteran Business Enterprise
ECTC	Erosion Control Technology Council
EIA	Electronic Industries Alliance
ESA	environmentally sensitive area
ETL	Electrical Testing Laboratories
f_c	extreme fiber compressive stress in concrete at service loads
f'_c	compressive strength of concrete
FHWA	Federal Highway Administration
GAAP	Generally Accepted Accounting Principles
GGBFS	ground granulated blast furnace slag; slag cement
GSP	galvanized steel pipe

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HMA	hot mix asphalt
HMA-O	hot mix asphalt (open graded)
HS	high strength
ICC	International Code Council
ITE	Institute of Transportation Engineers
IEEE	Institute of Electrical and Electronics Engineers
JMF	job mix formula
JPCP	jointed plain concrete pavement
ksf	kips per square foot
ksi	kips per square inch
LCB	lean concrete base
LCS	Department's lane closure system
LEED	Leadership in Energy and Environmental Design
LOTB	log of test boring
LTDS	long term design strength
MC	medium curing
METS	Caltrans Materials Engineering and Testing Services
MPI	Master Painters Institute
MR	movement rating
MSDS[b]	material safety data sheet
MT	magnetic particle testing
MUTCD	*Manual on Uniform Traffic Control Devices*
NDT	nondestructive testing
NETA	International Electrical Testing Association
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NPDES	National Pollutant Discharge Elimination System
NPT	National Pipe Thread Taper
NRTL	Nationally Recognized Testing Laboratory
OBC	optimum binder content
OGFC	open graded friction course
OSD	Offices of Structure Design
PLAC	permit, license, agreement, certification, or any combination of these
PC	precast
PCC	portland cement concrete
pcf	pounds per cubic foot
PG	performance grade
PI_0	zero blanking band profile index
PJP	partial joint penetration
POC	pedestrian overcrossing
PQR	procedure qualification record
PS	prestressed
PSF	pedestrian signal face
PV	programmed visibility
QSD	qualified SWPPP developer
QSP	qualified SWPPP practitioner
RAP	reclaimed asphalt pavement
RCSC	Research Council on Structural Connections
RECP	rolled erosion control product
RFI	request for information
RHMA	rubberized hot mix asphalt
RHMA-G	rubberized hot mix asphalt (gap graded)
RHMA-O	rubberized hot mix asphalt (open graded)

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RHMA-O-HB	rubberized hot mix asphalt (open graded high binder)
RPL	recycled plastic lumber
RSC	rapid strength concrete
RSP	rock slope protection
RSS	revised standard specifications
RT	radiographic testing
RWQCB	Regional Water Quality Control Board
SMSA	Standard Metropolitan Statistical Area
SC	slow curing
SCC	self-consolidating concrete
SCM	supplementary cementitious material
SDS	safety data sheet
SSPC	The Society for Protective Coatings
SWPPP	storm water pollution prevention plan
TEES	Transportation Electrical Equipment Specifications
TIA	time impact analysis
TRO	time-related overhead
TV	target value
UFFA	ultra fine fly ash
UL	Underwriters Laboratories, Inc
USC	United States Code
USM	unidentified stock material
UT	ultrasonic testing
VECP	value engineering change proposal
VFD	Variable-frequency drive
VPM	volts per mil
WPC	Water pollution control
WPCP	water pollution control program
WPS	welding procedure specification

[a]Interpret a reference to AWS as a reference to AWS, ANSI/AWS, or AASHTO/AWS

[b]Interpret a reference to MSDS as a reference to SDS under 29 CFR 1910.1200.

NOT FOR CONSTRUCTION

Bid Item List Abbreviations

Abbreviation	Meaning
ACRE	acre
CF	cubic foot
CY	cubic yard
EA	each
(F)	final pay item
GAL	gallon
H	hour
LB	pound
LF	linear foot
LS	lump sum
LNMI	lane mile
MFBM	thousand foot board measure
MI	mile
MSYD	thousand station yard
STA	station (100 feet)
SQFT	square foot
SQYD	square yard
TAB	tablet
TON	2,000 pounds
WDAY	working day

NOT FOR CONSTRUCTION

1-1.07 DEFINITIONS

1-1.07A General

Interpret terms as defined in the Contract documents. A term not defined in the Contract documents has the meaning defined in Means Illustrated Construction Dictionary, Condensed Version, Second Edition.

1-1.07B Glossary

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

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

aerially deposited lead: Lead primarily from vehicle emissions deposited within unpaved areas or formerly unpaved areas.

approval of the Contract: Execution of the Contract by the City Council, City of Placerville

archaeological monitoring area: Area within or near construction limits where access is allowed, but work is subject to archaeological monitoring.

archaeological resources: Remains of past human activity, including historic and prehistoric material (e.g., tools and tool fragments, hearth and food remains, structural remains, and human remains).

authorized laboratory: Independent testing laboratory (1) not employed or compensated by any subcontractor or subcontractor's affiliate providing other services for the Contract and (2) authorized by the Department.

base: Layer of specified material of planned thickness placed immediately below the pavement or surfacing.

basement material: Material in excavation or embankment under the lowest layer to be placed.

bid item: Specific work unit for which the Bidder provides a price.

Bid Item List: List of bid items and the associated quantities. The verified Bid Item List is the Bid Item List with verified prices. The Contract Proposal of Low Bidder at the Department's Web site is the verified Bid Item List. After Contract award, interpret a reference to the Bid Item List as a reference to the verified Bid Item List.

bridge: Structure that:

1. Has a bridge number
2. Carries a utility or railroad or vehicle, pedestrian, or other traffic over, under, or around obstructions or waterways

building-construction contract: Contract that has "Building Construction" on the cover of the *Notice to Bidders and Special Provisions*.

California Test: Department-developed test for determining work quality. For California Tests, go to the Caltrans METS Web site.

Caltrans/Department of Transportation: Department of Transportation as defined in St & Hwy Code § 20 and authorized in St & Hwy Code § 90; its authorized representatives.

certificate of compliance: Certificate stating the material complies with the Contract.

Certified Industrial Hygienist: Industrial hygienist certified in comprehensive practice by the American Board of Industrial Hygiene.

change order work: Work described in a *Change Order*, including extra work and work described in the Contract as change order work.

City: The City of Placerville, a municipal corporation of the State of California

commercial quality: Quality meeting the best general practices.

commercial source: Established business operating as a material source to the general public.

Contract: Written and executed contract as approved by the City Council between the City of Placerville and the Contractor.

Contract acceptance: Director's written acceptance of a completed Contract.

Contract Documents: Plans, *Notice to Bidders, Special Provisions, Proposal and Contract Book*.

Contract time: Number of original working days as adjusted by any time adjustment.

Contractor: Person or business or its legal representative approved by the City Council and entering into a Contract with the City of Placerville for performance of the work.

controlling activity: Construction activity that will extend the scheduled completion date if delayed.

critical path: Longest continuous chain of activities for the project that has the least amount of total float of all chains. In general, a delay on the critical path extends the scheduled completion date.

critical path method: Network based planning technique using activity durations and relationships between activities to calculate a schedule for the entire project.

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

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

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

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

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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.

delay: Event that extends the completion of an activity.

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

deduction: Money permanently taken from progress payment and final payment. Deductions are cumulative and are not retentions under Pub Cont Code § 7107.

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Department: The City of Placerville except that any references to the Department's forms, websites, manuals, guides, test methods. These shall be defined as forms, websites, manuals, guides, test methods of Caltrans.

EID: El Dorado Irrigation District

detour: Temporary route for traffic around a closed road part. A passageway through a job site is not a detour.

Director: The City Engineer for the City of Placerville.

Disabled Veteran Business Enterprise: Business certified as a DVBE by the Department of General Services, Office of Small Business and DVBE Services.

Disadvantaged Business Enterprise: Disadvantaged Business Enterprise as defined in 49 CFR 26.5.

dispose of: Remove from the job site.

divided highway: Highway with separated traveled ways for traffic, generally in opposite directions.

Engineer: The Resident Engineer responsible for the Contract's administration, the Resident Engineer's authorized representatives.

early completion time: Difference in time between an early scheduled completion date and the work completion date.

environmentally sensitive area: Area within or near construction limits where access is prohibited or limited to protect environmental resources.

estimated cost: Estimated cost of the project as shown on the *Notice to Bidders*.

extra work: Any work, desired or performed, but not included in the original Contract.

federal-aid contract: Contract that has a federal-aid project number on the cover of the *Notice to Bidders and Special Provisions*.

final pay item: Bid item whose quantity shown on the Bid Item List is the quantity paid.

fixed cost: Labor, material, or equipment cost directly incurred by the Contractor as a result of performing or supplying a particular bid item that remains constant regardless of the item's quantity.

float: Difference between the earliest and latest allowable start or finish times for an activity.

force account work: Work ordered on a construction project without an existing agreement on its cost, and performed with the understanding that the contractor will bill the owner according to the cost of labor, materials, and equipment, plus a certain percentage for overhead and profit.

grading plane: Basement material surface on which the lowest layer of subbase, base, pavement, surfacing, or other specified layer is placed.

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

holiday: Holiday shown in the following table:

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Holidays

Holiday	Date observed
Every Sunday	Every Sunday
New Year's Day	January 1st
Birthday of Martin Luther King, Jr.	3rd Monday in January
Lincoln's Birthday	February 12th
Washington's Birthday	3rd Monday in February
Cesar Chavez Day	March 31st
Memorial Day	Last Monday in May
Independence Day	July 4th
Labor Day	1st Monday in September
Columbus Day	2nd Monday in October
Veterans Day	November 11th
Thanksgiving Day	4th Thursday in November
Day after Thanksgiving Day	Day after Thanksgiving Day
Christmas Day	December 25th

If January 1st, February 12th, March 31st, July 4th, November 11th, or December 25th falls on a Sunday, the Monday following is a holiday. If November 11th falls on a Saturday, the preceding Friday is a holiday.

idle equipment: Equipment:

1. On the job site at the start of a delay
2. Idled because of the delay
3. Not operated during the delay

informal-bid contract: Contract that has "Informal Bid Authorized by Pub Cont Code § 10122" on the cover of the *Notice to Bidders and Special Provisions*.

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

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

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

listed species: Any species listed as threatened or endangered under (1) federal Endangered Species Act of 1973, 16 USC § 1531 et seq., (2) California Endangered Species Act, Fish & Game Code §§ 2050–2115.5, or (3) both.

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

material shortage: Shortage of raw or produced material that is area-wide and caused by an unusual market condition except if any of the following occurs:

1. Shortage relates to a produced, nonstandard material
2. Supplier's and the Contractor's priority for filling an order differs
3. Event outside the U.S. for a material produced outside the U.S.

material source facility audit: Self-audit and a Department audit evaluating a facility's capability to consistently produce materials that comply with Department standards.

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

milestone: Event activity that has zero duration and is typically used to represent the start or end of a certain stage of the project.

mobilization: Preparatory work that must be performed or costs incurred before starting work on the various items on the job site (Pub Cont Code § 10104).

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narrative report: Document submitted with each schedule that discusses topics related to project progress and scheduling.

near critical path: Chain of activities with total float exceeding that of the critical path but having no more than 10 working days of total float.

paleontological resources: Fossils and the deposits they are found in. Fossils are evidence of ancient life preserved in sediments and rock. Examples of paleontological resources are remains of (1) animals, (2) animal tracks, (3) plants, and (4) other organisms. Archaeological resources are not paleontological and fossils found within an archaeological resource are generally considered archaeological resources, not paleontological resources.

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

permitted biological activities: Monitoring, surveying, or other practices that require a take permit and project-specific permission from the U.S. Fish and Wildlife Service or NOAA Fisheries or a take permit or memorandum of understanding with the Department of Fish and Game.

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

1. **standard plans:** 2010 Standard Plans of the State of California, Department of Transportation (Caltrans)
2. **revised standard plans:** New or revised standard plans.
3. **project plans:** Drawings specific to the project, including authorized shop drawings.

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

protective radius: Minimum distance between construction activities and a regulated species.

Project: The work as contemplated in these documents and the construction drawings.

Proposal: The un-approved offer as submitted to the City for contemplation for the completion of the project.

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

regulated species: Any species protected by one or any combination of the following:

1. Federal Endangered Species Act of 1973, 16 USC § 1531 et seq.
2. California Endangered Species Act, Fish & Game Code §§ 2050–2115.5
3. Fish & Game Code §§ 1600–1616
4. National Environmental Policy Act, 42 USC § 4321 et seq.
5. California Environmental Quality Act, Pub Res Code § 21000 et seq.
6. Other law or regulation that governs activities that affect species or their habitats

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

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

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

routine biological activities: Biological monitoring, surveying, or other activity that does not require a take permit from the U.S. Fish and Wildlife Service or NOAA Fisheries or a take permit or memo of understanding with the Department of Fish and Game.

schedule:

1. **baseline schedule:** Initial schedule showing the original work plan starting on the date of Contract approval. This schedule shows no completed work to date and no negative float or negative lag to any activity.

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2. **revised schedule:** Schedule that incorporates a proposed or past change to logic or activity durations.
3. **updated schedule:** Current schedule developed from the accepted baseline and any subsequent accepted updated or revised schedules through regular monthly review to incorporate actual past progress.

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

service-approved biologist: Biologist whose activities must be approved by a state or federal agency as provided in PLACs.

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

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

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

1. **standard specifications:** 2010 Standard Specifications of the State of California, Department of Transportation (Caltrans) and Revised Standard Specifications. These specifications are in a book titled *Standard Specifications*.
2. **revised standard specifications:** New or revised standard specifications. These specifications are in a section titled *Revised Standard Specifications* of a book titled *Notice to Bidders and Special Provisions*.
3. **special provisions:** Specifications specific to the project. These specifications are in a section titled *Special Provisions* of a book titled *Notice to Bidders and Special Provisions*.

State: The State of California, including its agencies, departments or divisions whose conduct or action is related to the work or when referenced in the Standard Specifications "State" shall mean The City of Placerville, including its authorized officers, agents, consultants and volunteers.

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

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

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

submittal:

1. **action submittal:** Written and graphic information and samples that require the Department's response.
2. **informational submittal:** Written information that does not require the Department's response.

substantial defects: Defects plainly seen as damaged, displaced, or missing parts or improper functioning of materials, parts, equipment, or systems.

substructure: Bridge parts below the bridge seats, pier tops, and haunches for rigid-framed bridges or spring lines for arched bridges; includes abutment backwalls, abutment parapets, and wingwalls.

superstructure: Bridge parts except the substructure.

supplemental project information: Information relevant to the project, specified as supplemental project information, and made available to bidders.

Department-owned float: Time saved on the critical path by actions of the Department. It is the last activity shown on the schedule before the scheduled completion date.

surfacing: Uppermost layer of material placed on a traveled way or shoulders; pavement.

take: Legal definition regarding harm to listed species as defined in 16 USC § 1532 and Fish & Game Code § 86.

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take permit: Permit granted by the U.S. Fish and Wildlife Service or by the NOAA Fisheries that allows take of federal-listed species under 16 USC § 1539 or by the Department of Fish and Game that allows take of state-listed species under Fish & Game Code § 2081.

time impact analysis: Analysis using a CPM schedule developed specifically to demonstrate the effect a proposed or past change or delay has on the current scheduled completion date.

time-scaled network diagram: Graphic depiction of a CPM schedule comprised of activity bars with relationships for each activity represented by arrows. The tail of each arrow connects to the activity bar for the predecessor and points to the successor.

total bid: Sum of the item totals as verified by the Department; original Contract price.

total float: Amount of time that an activity or chain of activities can be delayed before extending the scheduled completion date.

traffic: Pedestrians, bicyclists, ridden or herded animals, vehicles, streetcars, and other conveyances either singularly or together while using any highway for purposes of travel.

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

traveled way: Roadway portion for the movement of vehicles except shoulders.

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

unauthorized work: Work performed beyond the lines and grades described in the Contract or established by the Engineer or extra work performed without authority.

USDOT: The United States of America Department of Transportation

withhold: Money temporarily or permanently taken from progress payment.

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

work plan: Detailed formulation of a program of action.

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

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1-1.08 RESERVED

1-1.09 FREEZE-THAW AREAS

Freeze-thaw areas are areas of the State where freeze-thaw cycles and heavy salting frequently occur. A project is in a freeze-thaw area if the project is specified in the special provisions to be in a freeze-thaw area.

1-1.10 RESERVED

1-1.11 WEB SITES, ADDRESSES, AND TELEPHONE NUMBERS

Web Sites, Addresses, and Telephone Numbers

Reference or agency or department unit	Web site	Address	Telephone no.
Authorized Laboratory Lists Authorized Material Lists Authorized Material Source Lists	http://www.dot.ca.gov/hq/esc/approved_products_list	--	--
CA Unified Certification Program's list of certified DBEs	http://www.dot.ca.gov/hq/bep/find_certified.htm	--	--
Caltrans	http://www.dot.ca.gov	--	--
Department of Conservation, Office of Mine Reclamation	http://www.conservation.ca.gov/omr/	--	--
Department of General Services, Office of Small Business and DVBE Services	http://www.dgs.ca.gov/dgs/ProgramsServices/BusServices.aspx	OFFICE OF SMALL BUSINESS AND DVBE SERVICES DEPARTMENT OF GENERAL SERVICES 707 3RD ST WEST SACRAMENTO CA 95605-2811	(800) 559-5529 (916) 375-4940
Department of Industrial Relations	http://www.dir.ca.gov	455 GOLDEN GATE AVENUE SAN FRANCISCO CA 94102	--
Caltrans Division of Construction	http://www.dot.ca.gov/hq/construc/	--	--
Geotechnical Services	http://www.dot.ca.gov/hq/esc/geotech	GEOTECHNICAL SERVICES DEPARTMENT OF TRANSPORTATION 5900 FOLSOM BLVD SACRAMENTO CA 95819-4612	(916) 227-7000
METS	http://www.dot.ca.gov/hq/esc/Translab/	MATERIALS ENGINEERING AND TESTING SERVICES DEPARTMENT OF TRANSPORTATION 5900 FOLSOM BLVD SACRAMENTO CA 95819-4612	(916) 227-7000
Caltrans Office Engineer	http://www.dot.ca.gov/hq/esc/oe/		(916) 227-6299
Caltrans Offices of Structure Design, Documents Unit	--	MSC 9-4/4I DOCUMENTS UNIT OFFICES OF STRUCTURE DESIGN DEPARTMENT OF TRANSPORTATION 1801 30TH ST SACRAMENTO CA 95816-7006	(916) 227-0716

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Publication Distribution Unit	--	PUBLICATION UNIT DEPARTMENT OF TRANSPORTATION 1900 ROYAL OAKS DRIVE SACRAMENTO CA 95815-3800	--

1-1.12 MISCELLANY

Make checks and bonds payable to the City of Placerville.

1-1.13–1-1.15 RESERVED

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2 BIDDING

2-1.01 GENERAL

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

2-1.02 BID INELIGIBILITY

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

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

2-1.04 CONTRACTOR REGISTRATION

No contractor or subcontractor may be listed on a bid proposal for a public works project (submitted on or after March 1, 2015) unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5 [with limited exceptions from this requirement for bid purposes only under Labor Code section 1771.1(a)].

2-1.05 RESERVED

2-1.06 BID DOCUMENTS

2-1.06A General

The Proposal section includes bid forms and certifications.

Standard Specifications and *Standard Plans* may be viewed at the Caltrans Office Engineer Web site and may be purchased at the Caltrans Publication Distribution Unit.

The *Notice to Bidders, Special Provisions, Proposal and Contract* and project plans may be viewed and obtained at the locations stated in the *Notice to Bidders*.

The *Notice to Bidders and Special Provisions, Proposal and Contract* includes the *Notice to Bidders*, revised standard specifications, special provisions, proposal and draft contract.

2-1.06B Supplemental Project Information

The Department makes supplemental information available as specified in the technical special provisions.

Logs of test borings are supplemental project information.

As-built drawings may not show existing dimensions and conditions. Where new construction dimensions are dependent on existing bridge dimensions, verify the field dimensions and adjust dimensions of the work to fit existing conditions.

2-1.06C–2-1.06D Reserved

2-1.07 JOB SITE AND DOCUMENT EXAMINATION

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

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

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

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2-1.08 RESERVED

2-1.09 BID ITEM LIST

Submit a bid based on the bid item quantities the Department shows on the Bid Item List.

2-1.10 SUBCONTRACTOR LIST

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

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

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

2-1.11 RESERVED

2-1.12 DISADVANTAGED BUSINESS ENTERPRISES

2-1.12A General

Section 2-1.12 applies to a federal-aid contract.

Under 49 CFR 26.13(b):

> The contractor, sub recipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate, which may include, but is not limited to:
>
> (1) Withholding monthly progress payments;
> (2) Assessing sanctions;
> (3) Liquidated damages; and/or
> (4) Disqualifying the contractor from future bidding as non-responsible.

Include this assurance in each subcontract you sign with a subcontractor.

2-1.12B Disadvantaged Business Enterprises

2-1.12B(1) General

Section 2-1.12B applies if a DBE goal is shown on the *Notice to Bidders*.

The Department shows a goal for DBEs to comply with the DBE program objectives provided in 49 CFR 26.1.

Make work available to DBEs and select work parts consistent with available DBEs, including subcontractors, suppliers, service providers, and truckers.

Meet the DBE goal shown on the *Notice to Bidders* or demonstrate that you made adequate good faith efforts to meet this goal.

You are responsible to verify at bid opening the DBE firm is certified as a DBE by the California Unified Certification Program and possess the work codes applicable to the type of work the firm will perform on the Contract.

Determine that selected DBEs perform a commercially useful function for the type of work the DBE will perform on the Contract as provided in 49 CFR 26.55(c)(1)–(4). Under 49 CFR 26.55(c)(1)–(4), the DBE

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must be responsible for the execution of a distinct element of work and must carry out its responsibility by actually performing, managing, and supervising the work.

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

Credit for materials or supplies you purchase from DBEs will be evaluated on a contract-by-contract basis and counts toward the goal in the following manner:

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

You receive credit toward the goal if you employ a DBE trucking company that is performing a commercially useful function. The Department uses the following factors in determining whether a DBE trucking company is performing a commercially useful function:

- The DBE must be responsible for the management and supervision of the entire trucking operation for which it is responsible on a particular contract, and there cannot be a contrived arrangement for the purpose of meeting DBE goals.
- The DBE must itself own and operate at least one fully licensed, insured, and operational truck used on the contract.
- The DBE receives credit for the total value of the transportation services it provides on the Contract using trucks it owns, insures, and operates using drivers it employs.
- The DBE may lease trucks from another DBE firm, including an owner-operator who is certified as a DBE. The DBE who leases trucks from another DBE receives credit for the total value of the transportation services the lessee DBE provides on the Contract.
- The DBE may lease trucks without drivers from a non-DBE truck leasing company. If the DBE leases trucks from a non-DBE truck leasing company and uses its own employees as drivers, it is entitled to credit for the total value of these hauling services.
- A lease must indicate that the DBE has exclusive use of and control over the truck. This does not preclude the leased truck from working for others during the term of the lease with the consent of the DBE, so long as the lease gives the DBE absolute priority for use of the leased truck. Leased trucks must display the name and identification number of the DBE.

[49 Fed Reg 59595 (10/2/14) (to be codified at 49 CFR 26.55(d)]

2-1.12B(2) DBE Commitment Submittal

Submit DBE information under section 2-1.33.

Submit written confirmation from each DBE shown on the DBE Commitment form stating that it will be participating in the Contract in the type and amount of work shown on the form. If a DBE is participating as a joint venture partner, submit a copy of the joint venture agreement.

2-1.12B(3) Good Faith Efforts Submittal

You can meet the DBE requirements by either documenting commitments to DBEs to meet the Contract goal or by documenting adequate good faith efforts to meet the Contract goal. An adequate good faith effort means that the bidder must show that it took all necessary and reasonable steps to achieve a DBE goal that, by their scope, intensity, and appropriateness to the objective, could reasonably be expected to meet the DBE goal.

If you have not met the DBE goal, complete and submit the DBE Good Faith Efforts Documentation form under section 2-1.33 showing that you made adequate good faith efforts to meet the goal. Only good faith efforts directed toward obtaining participation by DBEs are considered.

Submit good faith efforts documentation within the specified time to protect your eligibility for award of the contract in the event the Department finds that the DBE goal has not been met.

Refer to 49 CFR 26 app A for guidance regarding evaluation of good faith efforts to meet the DBE goal.

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The Department considers DBE commitments of other bidders in determining whether the low bidder made good faith efforts to meet the DBE goal.

2-1.13–2-1.14 RESERVED

2-1.15 DISABLED VETERAN BUSINESS ENTERPRISES

Not Used.

2-1.16–2-1.17 RESERVED

2-1.18 SMALL BUSINESS AND NON–SMALL BUSINESS SUBCONTRACTOR PREFERENCES

Not Used.

2-1.19–2-1.26 RESERVED

2-1.27 CALIFORNIA COMPANIES

Not Used.

2-1.28 RESERVED

2-1.29 OPT OUT OF PAYMENT ADJUSTMENTS FOR PRICE INDEX FLUCTUATIONS

Not Used.

2-1.30–2-1.32 RESERVED

2-1.33 BID DOCUMENT COMPLETION AND SUBMITTAL

2-1.33A General

Complete forms in the Proposal Section.

Do not fax forms except for the copies of forms with the public works contractor registration number submitted after the time of bid. Fax these copies to (530) 642-5568.

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

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

Submit your bid and any Proposal forms:

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

2-1.33B-2.133C

Not Used

2-1.33D Bid Form Submittal Schedules

2-1.33D(1) General

The *Bid* book includes forms specific to the contract. The deadlines for the submittal of the forms vary depending on the requirements of each contract. Determine the requirements of the contract and submit the forms based on the applicable schedule specified in section 2-1.33D.

Bid forms and information on the form that are due after the time of bid may be submitted at the time of bid.

2-1.33D(2) Federal-Aid Contracts

2-1.33D(2)(a) General

Section 2-1.33D(2) applies to a federal-aid contract.

2-1.33D(2)(b) Contracts with a DBE Goal

Section 2-1.33D(2)(b) applies if a DBE goal is shown on the *Notice to Bidders*,

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Submit the bid forms according to the schedule shown in the following table:

Bid Form Submittal Schedule for a Federal-Aid Contract with a DBE Goal

Form	Submittal deadline
Bid to the Department of Transportation	Time of bid except for the public works contractor registration number
Copy of the Bid to the Department of Transportation as submitted at the time of bid with the public works contractor registration number	10 days after bid opening
Subcontractor List	Time of bid except for the public works contractor registration number
Copy of the Subcontractor List as submitted at the time of bid with the public works contractor registration number	10 days after bid opening
Small Business Status	Time of bid
Opt Out of Payment Adjustments for Price Index Fluctuations[a]	Time of bid
DBE Commitment	No later than 4 p.m. on the 4th business day after bid opening
DBE Good Faith Efforts Documentation	No later than 4 p.m. on the 4th business day after bid opening

[a]Submit only if you choose the option.

2-1.33D(2)(c) Contracts without a DBE Goal

Reserved

2-1.33D(2)(d)–2-1.33D(2)(h) Reserved

2-1.33D(3) Non-Federal-Aid Contracts

Not Used

2-1.33D(4)–2-1.33D(9) Reserved

2-1.34 BIDDER'S SECURITY

Submit your bid with 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. Bidder's bond signed by a surety insurer who is licensed in California

Submit cash, cashier's check, certified check, or bidder's bond to the Department before the bid opening time.

If using a bidder's bond, you must use the form in the Proposal Section.

2-1.35–2-1.39 RESERVED

2-1.40 BID WITHDRAWAL

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.

After the bid opening time, you cannot withdraw a bid.

2-1.41–2-1.42 RESERVED

2-1.43 BID OPENING

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

NOT FOR CONSTRUCTION

2-1.44–2-1.45 RESERVED

2-1.46 DEPARTMENT'S DECISION ON BID

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 Rebecca Neves, City of Placerville Division of Engineering, Fax-(530) 642-5568. The *Relief of Bid Request* form is available at Caltrans Web site.

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.

NOT FOR CONSTRUCTION

3 CONTRACT AWARD AND EXECUTION

3-1.01 GENERAL

Section 3 includes specifications related to contract award and execution.

3-1.02 CONSIDERATION OF BIDS

3-1.02A General

For a lump sum based bid, the Department compares bids based on the total price.

For a unit price based bid, the Department compares bids based on the sum of the item totals.

For a cost plus time based bid, the Department compares bids based on the sum of the item totals and the total bid for time.

3-1.02B Tied Bids

The Department breaks a tied bid with a coin toss.

3-1.03 CONTRACTOR REGISTRATION

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

3-1.04 CONTRACT AWARD

Submit any bid protest to Rebecca Neves, City of Placerville Division of Engineering, at 3101 Center Street, Placerville, CA 95667, Fax-(530) 642-5568.

If the Department awards the contract, the award is made to the lowest responsible bidder within 60 days.The Department may extend the specified award period if the bidder agrees.

The City of Placerville reserves the right after bid opening to reject any or all bids, to waive irregularity in a bid, or to make award to the lowest responsive, responsible bidder and reject all other bids, as it may best serve the interests of the City.

Barring some unforeseen irregularity, Notice of Award will be sent to the lowest responsive responsible bidder after approval by the City of Placerville City Council.

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

The successful bidder must furnish 2 bonds:

1. Payment bond to secure the claim payments of laborers, workers, mechanics, or materialmen providing goods, labor, or services under the Contract. This bond must be equal to at least 100 percent of the total bid.
2. Performance bond to guarantee the faithful performance of the Contract. This bond must be equal to at least 100 percent of the total bid.

The Department furnishes the successful bidder with bond forms.

3-1.06 CONTRACTOR LICENSE

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

3-1.07 INSURANCE POLICIES

The successful bidder must submit:

1. Copy of its commercial general liability policy and its excess policy or binder until such time as a policy is available, including the declarations page, applicable endorsements, riders, and other modifications in effect at the time of contract execution. Standard ISO form no. CG 0001 or similar exclusions are allowed if not inconsistent with section 7-1.06. Allowance of additional exclusions is at the discretion of the Department.

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2. Certificate of insurance showing all other required coverages. Certificates of insurance, as evidence of required insurance for the auto liability and any other required policy, shall set forth deductible amounts applicable to each policy and all exclusions that are added by endorsement to each policy. The evidence of insurance shall provide that no cancellation, lapse, or reduction of coverage will occur without 10 days prior written notice to the Department.
3. A declaration under the penalty of perjury by a CPA certifying the accountant has applied GAAP guidelines confirming the successful bidder has sufficient funds and resources to cover any self-insured retentions if the self-insured retention is over $50,000.

If the successful bidder uses any form of self-insurance for workers compensation in lieu of an insurance policy, it shall submit a certificate of consent to self-insure under Labor Code § 3700.

3-1.08 SMALL BUSINESS PARTICIPATION REPORT

Not Used

3-1.09–3-1.10 RESERVED

3-1.11 PAYEE DATA RECORD

Complete and deliver a *Payee Data Record* when requested by the Department.

3-1.12 RESERVED

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.

3-1.14–3-1.17 RESERVED

3-1.18 CONTRACT EXECUTION

The successful bidder must sign the *Contract* form.

Deliver to the City:

1. Signed *Contract* form, including the attached form FHWA-1273
2. Contract bonds
3. Documents identified in section 3-1.07
4. A California Form 590-Withholding Exemption Certificate
5. A Federal Form W-9-Request for Taxpayer Identification Number and Certification

The City must receive these documents before the 8th business day after the bidder receives the Notice of award of Contract.

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

3-1.19 BIDDERS' SECURITIES

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

NOT FOR CONSTRUCTION

4 SCOPE OF WORK

4-1.01 GENERAL

Section 4 includes specifications related to the scope of work.

4-1.02 INTENT

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

Nothing in the specifications voids the Contractor's public safety responsibilities.

4-1.03 WORK DESCRIPTION

Construct the work described on the *Notice to Bidders* and as described in the Contract.

4-1.04 USE OF MATERIALS FOUND ON THE JOB SITE

You may use aggregate or other materials found in excavation that comply with the specifications. The Department pays for the material excavated at the excavation item Contract price. Replace the quantity of material removed and used with an equal quantity of material. The material must have been designated for use in the work. Except for material used as structure backfill, the Department does not pay for replacing the material. The Department pays for excavated material replacement used for structure backfill at the Contract price for structure backfill. Do not excavate material from outside the excavation's slope and grade lines without authorization.

4-1.05 CHANGES AND EXTRA WORK

4-1.05A General

The Department may make changes within the scope of work and add extra work. The Engineer describes the changes and extra work, the payment basis, and any time adjustment in a *Change Order*.

A *Change Order* is approved when the Department signs the *Change Order*.

Until the Department approves a *Change Order*, continue to perform the work under the Contract unless the Engineer orders you to start the work described in the *Change Order* before its approval.

Submit detailed cost data for a unit price adjustment for a bid item if (1) the Engineer requests the data or (2) you request a unit price adjustment resulting from a change of more than 25 percent in the bid item's quantity.

4-1.05B Work-Character Changes

The Department adjusts the unit price for an item if:

1. An ordered plan or specification change materially changes the character of a work item from that on which the bid price was based
2. The unit cost of the changed item differs when compared to the unit cost of that item under the original plans and specifications
3. No approved *Change Order* addresses the payment

4-1.06 DIFFERING SITE CONDITIONS (23 CFR 635.109)

4-1.06A General

Reserved

4-1.06B Contractor's Notification

Promptly notify the Engineer if you find either of the following conditions:

1. Physical conditions differing materially from either of the following:
   1.1. Contract documents
   1.2. Job site examination
2. Physical conditions of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in the work provided for in the Contract

Include details explaining the information you relied on and the material differences you discovered.

NOT FOR CONSTRUCTION

If you fail to promptly notify the Engineer, you waive the differing site condition claim for the period between your discovery of the differing site condition and your notification to the Engineer.

If you disturb the site after discovery and before the Engineer's investigation, you waive the differing site condition claim.

4-1.06C Engineer's Investigation and Decision

Upon your notification, the Engineer investigates job site conditions and:

1. Notifies you whether to resume affected work
2. Decides whether the condition differs materially and is cause for an adjustment of time, payment, or both

4-1.07 VALUE ENGINEERING

4-1.07A General

Reserved

4-1.07B Value Engineering Change Proposal

You may submit a VECP to reduce any of the following:

1. Total cost of construction
2. Construction activity duration
3. Traffic congestion

Before preparing a VECP, meet with the Engineer to discuss:

1. Proposal concept
2. Permit issues
3. Impact on other projects
4. Project impacts, including traffic, schedule, and later stages
5. Peer reviews
6. Overall proposal merits
7. Review times required by the Department and other agencies

The VECP must not impair the project's essential functions or characteristics, including:

1. Service life
2. Operation economy
3. Maintenance ease
4. Desired appearance
5. Design and safety

The VECP must include:

1. Description of the Contract specifications and drawing details for performing the work and the proposed changes.
2. Itemization of Contract specifications and plan details that would be changed.
3. Detailed cost estimate for performing the work under the existing Contract and under the proposed change. Determine the estimates under section 9-1.04.
4. Deadline for the Engineer to decide on the changes.
5. Bid items affected and resulting quantity changes.

The Department is not required to consider a VECP. If a VECP is similar to a change in the plans or specifications being considered by the Department at the time the proposal is submitted or if the proposal is based on or similar to plans or specifications adopted by the Department before Contract award, the Department does not accept the VECP and may make these changes without VECP payments.

If the Department does not approve a *Change Order* before the deadline stated in the VECP or other date you subsequently stated in writing, the VECP is rejected. The Department does not adjust time or payment for a rejected VECP.

NOT FOR CONSTRUCTION

The Department decides whether to accept a VECP and the estimated net construction-cost savings from adopting the VECP or parts of it.

The Department may require you to accept a share of the investigation cost as a condition of reviewing a VECP. After written acceptance, the Department considers the VECP and deducts the agreed cost.

If the Department accepts the VECP or parts of it, the Department issues a *Change Order* that:

1. Incorporates changes in the Contract necessary to implement the VECP or the parts adopted
2. Includes the Department's acceptance conditions
3. States the estimated net construction-cost savings resulting from the VECP
4. Obligates the Department to pay you 50 percent of the estimated net savings

In determining the estimated net construction-cost savings, the Department excludes your VECP preparation cost and the Department's VECP investigation cost, including parts paid by you.

If a VECP providing for a reduction in working days is accepted by the Department, 50 percent of the reduction is deducted from Contract time.

If a VECP providing for a reduction in traffic congestion or avoiding traffic congestion is accepted by the Department, the Department pays 60 percent of the estimated net savings in construction costs attributable to the VECP. Submit detailed traffic handling comparisons between the existing Contract and the proposed change, including estimates of the traffic volumes and congestion.

The Department may apply an accepted VECP for general use on other contracts.

If an accepted VECP is adopted for general use, the Department pays only the contractor who first submitted the VECP and only to the contracts awarded to that contractor before the submission of the accepted VECP.

If the Department does not adopt a general-use VECP, an identical or similar submitted proposal is eligible for acceptance.

4-1.07C Value Analysis Workshop

Not Used

4-1.8–4-1.12 RESERVED

4-1.13 CLEANUP

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

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

Do not remove warning, regulatory, or guide signs until Contract acceptance.

NOT FOR CONSTRUCTION

5 CONTROL OF WORK

5-1.01 GENERAL

Section 5 includes specifications regarding the Contract parties' relations and Contract acceptance.

Furnish the resources except Department-furnished materials required to complete the work as described in the Contract.

Provide QC.

Work is subject to the Department's QA. The Department's QA does not relieve you of your responsibility to provide QC.

Ensure the Department's safe and unrestricted access to the work. Furnish facilities necessary for the Department's inspection.

Where the means and methods to complete the work are not described in the Contract, choose the means and methods to complete the work.

Where the Contract describes more than 1 construction method or more than 1 type of material or equipment, the Department does not assure that each construction method or type of material or equipment can be used successfully throughout all or any part of the project. You are responsible to use the alternative or alternatives that will accomplish the work under the conditions encountered.

Failure to comply with any Contract part is a waiver of your right to an adjustment of time and payment related to that part.

Use contract administration forms at the Caltrans Web site unless directed otherwise.

5-1.02 CONTRACT COMPONENTS

A component in one Contract part applies as if appearing in each. The parts are complementary and describe and provide for a complete work.

If a discrepancy exists:

1. The governing ranking of Contract parts in descending order is:
   1.1. Technical Specifications
   1.2. Special provisions
   1.3. Project plans
   1.4. Revised standard specifications
   1.5. Standard specifications
   1.6. Revised standard plans
   1.7. Standard plans
   1.8. Supplemental project information
2. Written numbers and notes on a drawing govern over graphics
3. A detail drawing governs over a general drawing
4. A detail specification governs over a general specification
5. A specification in a section governs over a specification referenced by that section

If a discrepancy is found or confusion arises, submit an RFI.

5-1.03 ENGINEER'S AUTHORITY

The Engineer makes the final decision on questions regarding the Contract, including:

1. Work quality and acceptability
2. Manner of performance of the work
3. Drawing and specification interpretation
4. Contract fulfillment
5. Time and progress rate
6. Measurement and payment

The Engineer has the authority to enforce or fulfill an order that you fail to fulfill promptly.

Failure to enforce a Contract part does not waive enforcement of any Contract provision.

The Engineer may reject work that does not comply with the Contract at any time, including after a payment has been made.

5-1.04–5-1.05 RESERVED

5-1.06 PROTESTS

You may protest an Engineer's decision by submitting an RFI.

NOT FOR CONSTRUCTION

5-1.07–5-1.08 RESERVED

5-1.09 PARTNERING

Not Used

5-1.10–5-1.11 RESERVED

5-1.12 ASSIGNMENT

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

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

5-1.13 SUBCONTRACTING

5-1.13A General

No subcontract releases you from the Contract or relieves you of your responsibility for a subcontractor's work.

Before subcontracted work starts, submit a *Subcontracting Request* form.

Do not use a debarred contractor. For a list of debarred contractors, go to the Department of Industrial Relations' Web site.

If you violate Pub Cont Code § 4100 et seq., the Department may exercise the remedies provided under Pub Cont Code § 4110. The Department may refer the violation to the Contractors State License Board as provided under Pub Cont Code § 4111.

Except for a building-construction non-federal-aid contract, perform work equaling at least 30 percent of the value of the original total bid with your employees and with equipment you own or rent, with or without operators.

Each subcontract must comply with the Contract.

The Department encourages you to include a dispute resolution process in each subcontract.

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

Submit copies of subcontracts upon request.

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

5-1.13B Disadvantaged Business Enterprises

5-1.13B(1) General

Section 5-1.13B applies to a federal-aid contract.

Use each DBE as listed on the DBE Commitment form unless you receive authorization for a substitution. Ensure that all subcontracts and agreements with DBEs to supply labor or materials are performed under 49 CFR 26.

Maintain records including:

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

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

NOT FOR CONSTRUCTION

Before the 15th day of each month for the previous month's work, submit:

1. Monthly DBE Trucking Verification form
2. Monthly DBE Payment form

If a DBE is decertified before completing its work, the DBE must notify you in writing of the decertification date. If a business becomes a certified DBE before completing its work, the business must notify you in writing of the certification date. Submit the notifications. On work completion, complete a Disadvantaged Business Enterprises (DBE) Certification Status Change form. Submit the form within 30 days of Contract acceptance.

Upon work completion, complete a Final Report – Utilization of Disadvantaged Business Enterprises (DBE), First-Tier Subcontractors form. Submit it within 30 days of Contract acceptance. The Department withholds $10,000 until the form is submitted. The Department releases the withhold upon submission of the completed form.

5-1.13B(2) Performance of Disadvantaged Business Enterprises

Section 5-1.13(B)(2) applies if a DBE goal is shown on the *Notice to Bidders*.

DBEs must perform work or supply materials as listed on the DBE Commitment form.

Do not terminate or substitute a listed DBE for convenience and perform the work with your own forces or those of an affiliate, a non-DBE firm, or another DBE firm or obtain materials from other sources without authorization from the Department.

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

1. Listed DBE fails or refuses to execute a written contract based on the plans and specifications for the project.
2. You stipulated that a bond is a condition of executing the subcontract and the listed DBE fails to meet your bond requirements.
3. Work requires a contractors license and the 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. Department determines other documented good cause under 49 CFR 26.53.

Notify the original DBE of your intent to use other forces or material sources and provide the reasons. Provide the DBE with 5 days to respond to your notice and advise you and the Department of the reasons why the use of other forces or sources of materials should not occur. Your request to use other forces or material sources must include:

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

If the Department authorizes the termination or substitution of a listed DBE, make good faith efforts to find another DBE. The substitute DBE must (1) perform at least the same amount of work as the original DBE under the Contract to the extent needed to meet the DBE goal and (2) be certified as a DBE with the work code applicable to the type of work the DBE will perform on the Contract at the time of your request for substitution. Submit your good faith effort documentation within 7 days of your request for authorization of the substitution. The Department may authorize a 7-day extension of this submittal period at your request. Refer to 49 CFR 26 app A for guidance regarding evaluation of good faith efforts to meet the DBE goal.

NOT FOR CONSTRUCTION

Unless the Department authorizes a request to terminate or substitute a listed DBE, the Department does not pay for work unless it is performed or supplied by the DBE listed on the DBE Commitment form. You may be subject to other sanctions under 49 CFR 26.

5-1.13C Disabled Veteran Business Enterprises

Not used

5-1.13E–5-1.13I Reserved

5-1.14–5-1.15 RESERVED

5-1.16 REPRESENTATIVE

Before starting work, assign a representative to:

1. Receive the Engineer's orders
2. Prosecute the Engineer's orders
3. Supervise the workers
4. Coordinate the subcontractors' work

The representative must be present at the job site while work is in progress. The representative must submit contact information (name, telephone number) so the representative can be easily contacted to perform emergency work while work is not in progress.

5-1.17 CHARACTER OF WORKERS

If a worker appears to the Engineer to be incompetent or acts disorderly or improperly, discharge the worker immediately upon request. Do not employ that worker again on the work.

5-1.18–5.19 RESERVED

5-1.20 COORDINATION WITH OTHER ENTITIES

5-1.20A General

Other entities may perform work at or near the job site and material sources at any time. Coordinate activities to avoid delays.

Each contractor or other entity performing work at or near the job or material site is responsible to the other for damage to work, persons, or property and for costs due to unnecessary delays.

5-1.20B Permits, Licenses, Agreements, and Certifications

5-1.20B(1) General

Comply with PLACs. The Department makes PLAC changes under section 4-1.05. Maintain a copy of each PLAC at the job site.

5-1.20B(2) Before Award

To make a change to a PLAC made available to you before award, submit the proposed change. The Department sends the proposed change to the appropriate authority for consideration.

5-1.20B(3) After Award

Confirm with the Engineer which after-award PLACs are obtained by the Department and which are obtained by the Contractor.

To make a change to an after-award PLAC obtained by the Department, submit the proposed change. The Department sends the proposed change to the appropriate authority for consideration.

Obtain those PLACs to be issued to you and pay fees and costs associated with obtaining them. Submit copies of Contractor-obtained after-award PLACs for review.

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

Before procuring material from or disposing of material on nonhighway property:

1. Submit a written agreement from the property owner:
   1.1. For property use

NOT FOR CONSTRUCTION

1.2. Absolving the Department from responsibility in connection with the property
2. Obtain authorization to start

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

5-1.20C Railroad Relations

Not Used.

5-1.20D–5-1.20F Reserved

5-1.21–5-1.22 RESERVED

5-1.23 SUBMITTALS

5-1.23A General

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

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

Submit action and informational submittals to the Engineer.

Each sheet of a submittal must include:

1. Contract number
2. District–County–Route–Post Mile
3. Structure name and number, if any

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

Convert foreign language documents to English and U.S. customary units.

5-1.23B Action Submittals

5-1.23B(1) General

Action submittals include:

1. Shop drawings
2. Product data
3. Samples
4. Test samples
5. Quality control plans
6. Work plans
7. Material sources
8. Test data, test results, and evaluation reports

Maintain a sequential list of submittals except for samples, test samples, and material sources. With each individual submittal, submit a copy of the updated list.

Submit an action submittal before the start of the affected work to allow for review and corrections without work delays.

Except for test samples, obtain the Department's authorization for action submittals before you perform work based on them.

Except for shop drawings and test samples, allow 15 days for review.

For a revised submittal, allow the same number of days for review as for the original submittal.

The time allowed for the review of a submittal starts when the Department receives the submittal.

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

Do not change the scope of work on revised submittals.

NOT FOR CONSTRUCTION

The Department's authorization of a submittal does not void any Contract part.

5-1.23B(2) Shop Drawings

Submit shop drawings as specified and as otherwise required to control the work.

Each drawing and calculation sheet must be in black ink and sequentially numbered.

Each drawing sheet must:

1. Be 11 by 17 inches
2. Be on minimum of 20 lb paper
3. Have text of minimum nominal height of 5/32 inch

Each calculation sheet must:

1. Be 8-1/2 by 11 inches
2. Have text of a minimum 12-point font

Text and graphics must be legible for photocopying and reduction.

Calculations must demonstrate the design adequacy. Calculations specified as independently checked must be sealed and signed by an engineer who is registered as a civil engineer in the State and who did not seal and sign the drawings.

Allow 20 days for the review.

If multiple sets are submitted simultaneously or an additional set is submitted before the review of a previously submitted set is complete, designate the sequence that the sets are to be reviewed. Allow review time specified plus 15 days for each additional set. A set consists of 40 or fewer sheets.

If drawings require corrections, the Department:

1. Describes deficiencies
2. Stamps the drawings with the date that the review stopped
3. Returns the drawings

Show set revision number. Uniquely number each revised detail. Show the number in an inverted triangle near the revised portion of the detail. In a legend, describe and date the revision.

Upon review completion, the Department returns 1 copy that shows the authorized date.

To make a change to an authorized drawing, submit it as specified for a new submittal. Note the changes.

After the work shown on the drawings is complete, submit electronic copies of as-built drawings. Include an index of sheet numbers and titles on the 1st sheet for each structure. Arrange the drawings in the drawing-number order shown in the index.

5-1.23B(3) Product Data

Reserved

5-1.23B(4) Samples

Reserved

5-1.23B(5) Test Samples

For test samples, comply with section 6-3.05G.

If requested, obtain the Department's authorization for the material before incorporating the material represented by the test sample into the work.

5-1.23B(6) Quality Control Plans

Submit 7 copies of each authorized QC plan and make 1 copy available at each location where work is performed.

NOT FOR CONSTRUCTION

5-1.23B(7) Work Plans

Reserved

5-1.23C Informational Submittals

Informational submittals include:

1. Assignments
2. Certificates of compliance
3. Manufacturer instructions not associated with drawing submittals
4. Notifications
5. PLACs
6. Subcontracts

5-1.24–5-1.25 RESERVED

5-1.26 CONSTRUCTION SURVEYS

Not Used.

5-1.27 RECORDS

5-1.27A General

Reserved

5-1.27B Record Retention

Retain project records from bid preparation through:

1. Final payment
2. Resolution of claims, if any

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

1. Bid preparation
2. Overhead
3. Payrolls
4. Payments to subcontractors and suppliers
5. Cost accounting

Maintain the records in an organized way in the original format, electronic and hard copy, conducive to professional review and audit.

5-1.27C Record Inspection, Copying, and Auditing

Make your records available for inspection, copying, and auditing by City and/or State representatives for the same time frame specified under section 5-1.27B. The records of subcontractors and suppliers must be made available for inspection, copying, and auditing by City and/or State representatives for the same period. Before Contract acceptance, the City and/or State representative notifies the Contractor, subcontractor, or supplier 5 business days before inspection, copying, or auditing.

If an audit is to start more than 30 days after Contract acceptance, the City and/or State representative notifies the Contractor, subcontractor, or supplier when the audit is to start.

5-1.27D Cost Accounting Records

Maintain cost accounting records for the project distinguishing between the following work cost categories:

1. Work performed based on bid item prices
2. Change order work other than extra work. Distinguish this work by:
   - 2.1. Bid item prices
   - 2.2. Force account
   - 2.3. Agreed price
3. Extra work. Distinguish extra work by:
   - 3.1. Bid item prices

NOT FOR CONSTRUCTION

3.2. Force account
3.3. Agreed price
3.4. Specialist billing
4. Work performed under potential claim records
5. Overhead
6. Subcontractors, suppliers, owner-operators, and professional services

Cost accounting records must include:

1. Final cost code lists and definitions
2. Itemization of the materials used and corresponding vendor's invoice copies
3. Direct cost of labor
4. Equipment rental charges
5. Workers' certified payrolls
6. Equipment:
   6.1. Size
   6.2. Type
   6.3. Identification number
   6.4. Hours operated

5-1.27E Change Order Bills

Maintain separate records for change order work costs.

Submit change order bills to the Engineer.

5-1.28–5-1.29 RESERVED

5-1.30 NONCOMPLIANT AND UNAUTHORIZED WORK

Correct or remove and replace work that does not comply with the Contract, is unauthorized, or both. The Department does not pay for any of the following:

1. Corrective, removal, or replacement work
2. Unauthorized work

If ordered, submit a work plan for the corrective, removal, or replacement work.

The Department may reduce payment for noncompliant work left in place.

If you fail to comply promptly with an order under section 5-1.30, the Department may correct, remove, or replace noncompliant or unauthorized work. The Department deducts the cost of this work.

5-1.31 JOB SITE APPEARANCE

Keep the job site neat. In areas visible to the public:

1. If practicable, dispose of debris removed during clearing and grubbing concurrently with its removal. If stockpiling is necessary, dispose of weekly.
2. Furnish trash bins for debris from construction. Place debris in trash bins daily.
3. Stack forms for falsework to be reused neatly and concurrently with their removal.

5-1.32 AREAS FOR USE

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

If no City-owned area is designated for the Contractor's use, you may arrange for temporary storage with the Department.

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

The Department does not allow temporary residences within the highway.

NOT FOR CONSTRUCTION

5-1.33 EQUIPMENT

Clearly stencil or stamp at a clearly visible location on each piece of equipment except hand tools an identifying number and:

1. On compacting equipment, its make, model number, and empty gross weight that is either the manufacturer's rated weight or the scale weight
2. On meters and on the load-receiving element and indicators of each scale, the make, model, serial number, and manufacturer's rated capacity

Submit a list describing each piece of equipment and its identifying number.

Upon request, submit manufacturer's information that designates portable vehicle scale capacities.

For proportioning materials, use measuring devices, material plant controllers, and undersupports complying with section 9-1.02B.

Measuring devices must be tested and approved under California Test 109 in the Department's presence by any of the following:

1. County Sealer of Weights and Measures
2. Scale Service Agency
3. Division of Measurement Standards Official

The indicator over-travel must be at least 1/3 of the loading travel. The indicators must be enclosed against moisture and dust.

Group measuring system dials such that the smallest increment for each indicator can be read from the location at which proportioning is controlled.

5-1.34–5-1.35 RESERVED

5-1.36 PROPERTY AND FACILITY PRESERVATION

5-1.36A General

Preserve property and facilities, including:

1. Adjacent property
2. Department's instrumentation
3. ESAs
4. Lands administered by other agencies
5. Railroads and railroad equipment
6. Roadside vegetation not to be removed
7. Temporary work
8. Utilities
9. Waterways
10. Survey monuments

Immediately report damage to the Engineer.

If you cause damage, you are responsible.

The Department may make a temporary repair to restore service to a damaged facility.

Install sheet piling, cribbing, bulkheads, shores, or other supports necessary to support existing facilities or support material carrying the facilities.

Maintain temporary facilities until they are no longer needed.

Dispose of temporary facilities when they are no longer needed.

Excavate and backfill as necessary to remove temporary facilities. Backfill with materials of equal or better quality and to a comparable density of surrounding materials and grade surface to match the existing grade and cross slope.

NOT FOR CONSTRUCTION

5-1.36B Landscape

If you damage plants not to be removed:

1. Dispose of them unless the Engineer authorizes you to reduce them to chips and spread the chips within the highway at locations designated by the Engineer
2. Replace them

Replace plants with plants of the same species.

Replace trees with 24-inch-box trees.

Replace shrubs with no. 15-container shrubs.

Replace ground cover plants with plants from flats. Replace *Carpobrotus* ground cover plants with plants from cuttings. Plant ground cover plants 1 foot on center.

If a plant establishment period is specified, replace plants before the start of the plant establishment period; otherwise, replace plants at least 30 days before Contract acceptance.

Water each plant immediately after planting and saturate the backfill soil around and below the roots or ball of earth around the roots of each plant. Water as necessary to maintain plants in a healthy condition until Contract acceptance.

5-1.36C Railroad Property

Not Used.

5-1.36D Nonhighway Facilities

The Department may rearrange a nonhighway facility during the Contract. Rearrangement of a nonhighway facility includes installation, relocation, alteration, or removal of the facility.

The Department may authorize facility owners and their agents to enter the highway to perform rearrangement work for their facilities or to make connections or repairs to their property. Coordinate activities to avoid delays.

Notify the Engineer at least 3 business days before you contact the regional notification center under Govt Code § 4216 et seq. Failure to contact the notification center prohibits excavation.

Before starting work that could damage or interfere with underground infrastructure, locate the infrastructure described in the Contract, including laterals and other appurtenances, and determine the presence of other underground infrastructure inferred from visible facilities such as buildings, meters, and junction boxes.

Notify the Engineer if the infrastructure described in the Contract cannot be found. If after giving the notice, you find the infrastructure in a substantially different location from described, finding the infrastructure is change order work.

Underground infrastructure described in the Contract may be in different locations from described, and additional infrastructure may exist.

Upon discovering an underground main or trunk line not described in the Contract, immediately notify the Engineer and the infrastructure owner. The Engineer orders the locating and protecting of the infrastructure. The locating and protecting is change order work. If ordered, repair infrastructure damage. If the damage is not due to your negligence, the repair is change order work.

If necessary underground infrastructure rearrangement is not described in the Contract, the Engineer may order you to perform the work. The rearrangement is change order work.

If you want infrastructure rearrangement different from that described in the Contract:

1. Notify the Engineer
2. Make an arrangement with the infrastructure owner
3. Obtain authorization for the rearrangement

NOT FOR CONSTRUCTION

4. The Department does not adjust time or payment for rearrangement different from that described the Contract
5. Pay the infrastructure owner any additional cost

Immediately notify the Engineer of a delay due to:

1. The presence of main line underground infrastructure not described in the Contract or in a substantially different location
2. Rearrangement different from that described the Contract

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.

5-1.37 MAINTENANCE AND PROTECTION

5-1.37A General

Maintain and protect work until the Department has granted relief from maintenance or accepted the Contract.

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.

Prevent construction equipment that exceeds the maximum weight limits in Veh Code Div 15 from operating on completed or existing treated base, pavement, or structures.

5-1.37B Load Limits

5-1.37B(1) General

For areas within the project limits and subject to the Contractor providing protective measures and repairing related damage, construction equipment exceeding the size or weight limits in Veh Code Div 15 may move over:

1. Public roads within the highway
2. Treated base or pavement under construction or completed
3. Culverts and pipes
4. Structures not open to traffic that are designed for AASHTO HS20-44 live loading, except culverts and pipes. Before crossing one of these structures, submit the dimensions and maximum axle loadings of the equipment; and unless a material hauling equipment lane on a bridge is shown on the drawings, comply with the following specifications:
   - 4.1. The maximum loading on a bridge due to pneumatic-tired truck and trailer combinations must not exceed:
     - 4.1.1. 28,000 lb for single axles
     - 4.1.2. 48,000 lb for tandem axles
     - 4.1.3. 60,000 lb total gross load for single vehicles
     - 4.1.4. 110,000 lb total gross load for truck and trailer or semi-trailer combinations
   - 4.2. The loading on a bridge due to 2- and 3-axle pneumatic tired earthmovers must not exceed that shown in the following table:

NOT FOR CONSTRUCTION

Allowable Construction Loading on Bridges for 2- and 3-Axle Earthmovers

Bridge girder center-to-center spacing (feet)	Maximum axle loading (pounds)
4	28,000
5	29,000
6	30.000
7	32,000
8	34,000
9	37,000
10 and over	40,000

NOTE: Minimum axle spacing:
For 2-axle earthmovers:
Axles 1 to 2 = 20 feet

For 3-axle earthmovers:
Axles 1 to 2 = 8 feet
Axles 2 to 3 = 20 feet

5. Completed or existing base, pavement, and structures under the Caltrans *Transportation Permits Manual*, whether open to the public or not

Loads imposed on existing, new, or partially completed structures must not exceed the load carrying capacity of the structure or any portion of the structure as determined by AASHTO LRFD with interims and California Amendments, Design Strength Limit State II. The f'_c to be used in computing the load carrying capacity must be the smaller of the following:

1. Actual compressive strength at the time of loading
2. Value of f'_c shown on the plans for that portion of the structure or 2.5 times the value of f_c shown on the plans for portions of the structure where no f'_c is shown

5-1.37B(2) Increased Load Carrying Capacity

You may submit a request to the Department to redesign a structure to increase its load carrying capacity.

The Department does not authorize a redesign for any of the following:

1. Load increase more than 130,000 lb per single axle or pair of axles less than 8 feet apart
2. Total gross vehicle weight more than 330,000 lb

Your request to the Department must include:

1. Description of the structure or structures
2. Detailed overload description
3. Date the revised plans are required
4. Signed statement agreeing to pay the costs, including the engineering costs
5. Signed statement agreeing to waive a time extension request for any delay

If the Department authorizes a redesign to strengthen the structure, the Engineer notifies you of the change's estimated cost and availability date of the revised plans. If the cost and date are satisfactory to you, the Engineer prepares a *Change Order* for the changes.

5-1.37B(3) Material Hauling Equipment Lane on Bridges

Section 5-1.37B(3) applies to a bridge constructed with a material hauling equipment lane.

You may cross the bridge with pneumatic-tired material hauling equipment that exceeds the size and weight limits specified but that does not exceed the load limits shown on the material hauling equipment loading diagram on the plans.

For each bridge with a material hauling equipment lane:

NOT FOR CONSTRUCTION

1. Construct a minimum 150-foot approach at each bridge end to a grade that provides a smooth transition to the bridge roadway grade. Maintain these approaches in a smooth and uniform condition during the operation of the equipment.
2. Operate equipment in a way that prevents jolting and bouncing of the equipment while crossing the bridge.
3. Confine equipment to the material hauling lane using temporary barriers unless the plans show that the entire bridge may be used for hauling equipment and the permanent barriers are completed.
4. At most 1 piece of equipment may be on the bridge at one time.

If ordered, verify the weight of loaded material hauling equipment by weighing. The Department furnishes individual wheel or axle type scales. The Department weighs the equipment within the project limits and within the highway at a location accessible to the equipment. You determine the exact weighing location. Install and maintain the scales. Installing and maintaining scales is change order work.

5-1.38 MAINTENANCE AND PROTECTION RELIEF

You may request relief from maintenance and protection responsibilities on a completed work portion. The work portion must have been completed under the Contract and to the Engineer's satisfaction. Work parts eligible for relief include:

1. Completed 0.3 mi of roadway or 0.3 mi of one roadway of a divided highway or frontage road including:
   1.1. Planned roadway protection work
   1.2. Lighting
   1.3. Required traffic control
   1.4. Access facilities
2. Bridge or other major structure
3. Complete unit of a traffic control signal system or a highway lighting system
4. Nonhighway facility constructed for another agency

If relieved by the Department, you are not required to perform further work on that portion of work. On a relieved portion of work, you are not responsible for damage, including damage caused by traffic or the elements, except for that caused by your own activities or negligence.

5-1.39 DAMAGE REPAIR AND RESTORATION

5-1.39A General

Before Contract acceptance, restore damaged work to the same state of completion as before the damage. Restoration of damaged work includes restoration of erected falsework and formwork.

The Department does not adjust payment for repair or restoration that the Engineer determines was caused by your failure to construct the work under the Contract or protect the work.

5-1.39B Damage Caused by an Act of God

Under Pub Cont Code § 7105, the Department pays for repair or restoration to damaged work in excess of 5 percent of the total bid if the damage was caused by an act of God.

Submit a request for repair or restoration work payment before performing work other than emergency work.

The Engineer determines the repair or restoration work cost under section 9-1.04 except markups are not allowed.

The Department may change the Contract for the areas requiring repair or restoration. If the cost for the changes exceeds the repair or restoration cost based on the Bid Item List, the Engineer determines the payment adjustment under section 9-1.04.

5-1.39C Landscape Damage

5-1.39C(1) General

Repair slopes or other existing facilities that were damaged after starting job site activities and before starting plant establishment.

NOT FOR CONSTRUCTION

As ordered, replace plants that have been damaged from either or both of the following conditions:

1. Ambient air temperature falling below 32 degrees F during the plant establishment period
2. Department or its supplier restricting or stopping water delivery during the plant establishment period

This plant replacement work is change order work.

5-1.39C(2) Plant Establishment Period of 3 Years or More

Section 5-1.39C(2) applies if a plant establishment period of 3 years or more is shown on the *Notice to Bidders*. Perform work specified in section 5-1.39C(2) as ordered.

Repair slopes or other existing facilities that were damaged before starting job site activities. This work is change order work.

Repair slopes or other existing facilities that were damaged by a change in the runoff pattern from that which existed on the date of the *Notice to Bidders* and was the result of work by others within the highway. This work is change order work.

Replace plants and repair slopes, irrigation systems, and other highway facilities damaged as a result of rain during the plant establishment period. The Department pays 1/2 the accumulated costs in excess of the greater of 5 percent of the plant establishment work or $2,000; the Contractor pays the other 1/2. The Engineer determines the repair cost under section 9-1.04.

5-1.40–5-1.41 RESERVED

5-1.42 REQUESTS FOR INFORMATION

Submit an RFI upon recognition of any event or question of fact arising under the Contract.

The Engineer responds to the RFI within 5 days. Proceed with the work unless otherwise ordered. You may protest the Engineer's response by:

1. Submitting an *Initial Potential Claim Record* within 5 days after receiving the Engineer's response
2. Complying with section 5-1.43

5-1.43 POTENTIAL CLAIMS AND DISPUTE RESOLUTION

5-1.43A General

Minimize and mitigate impacts of potentially claimed work or event.

For each potential claim, assign an identification number determined by chronological sequencing and the 1st date of the potential claim.

Use the identification number for each potential claim on the:

1. *Initial Potential Claim Record*
2. *Supplemental Potential Claim Record*
3. *Full and Final Potential Claim Record*

Failure to comply with this procedure is:

1. Waiver of the potential claim and a waiver of the right to a corresponding claim for the disputed work in the administrative claim procedure
2. Bar to arbitration (Pub Cont Code § 10240.2)

5-1.43B Initial Potential Claim Record

Submit an *Initial Potential Claim Record* within 5 days of the Engineer's response to the RFI or within 5 days from the date when a dispute arises due to an act or failure to act by the Engineer. The *Initial Potential Claim Record* establishes the claim nature and circumstances. The claim nature and circumstances must remain consistent.

The Engineer responds within 5 days of receiving the *Initial Potential Claim Record*. Proceed with the potentially claimed work unless otherwise ordered.

NOT FOR CONSTRUCTION

Within 20 days of a request, provide access to the project records determined necessary by the Engineer to evaluate the potential claim.

5-1.43C Supplemental Potential Claim Record

Within 15 days of submitting the *Initial Potential Claim Record*, submit a *Supplemental Potential Claim Record* including:

1. Complete nature and circumstances causing the potential claim or event
2. Contract specifications supporting the basis of a claim
3. Estimated claim cost and an itemized breakdown of individual costs stating how the estimate was determined
4. TIA

The Engineer evaluates the *Supplemental Potential Claim Record* and furnishes you a response within 20 days of receiving the submittal. To pursue a potential claim, comply with sections 5-1.43D and 5-1.43E.

If the estimated cost or effect on the scheduled completion date changes, update the *Supplemental Potential Claim Record* information as soon as the change is recognized and submit this information.

5-1.43D Full and Final Potential Claim Record

Notify the Engineer within 10 days of the completion date of the potentially claimed work. The Engineer authorizes this completion date or notifies you of a revised date.

Within 30 days of the completion of the potentially claimed work, submit a *Full and Final Potential Claim Record* including:

1. A detailed factual account of the events causing the potential claim, including:
   - 1.1. Pertinent dates
   - 1.2. Locations
   - 1.3. Work items affected by the potential claim
2. The Contract documents supporting the potential claim and a statement of the reasons these parts support entitlement
3. If a payment adjustment is requested, an itemized cost breakdown. Segregate costs into the following categories:
   - 3.1. Labor, including:
     - 3.1.1. Individuals
     - 3.1.2. Classifications
     - 3.1.3. Regular and overtime hours worked
     - 3.1.4. Dates worked
   - 3.2. Materials, including:
     - 3.2.1. Invoices
     - 3.2.2. Purchase orders
     - 3.2.3. Location of materials either stored or incorporated into the work
     - 3.2.4. Dates materials were transported to the job site or incorporated into the work
   - 3.3. Equipment, including:
     - 3.3.1. Detailed descriptions, including make, model, and serial number
     - 3.3.2. Hours of use
     - 3.3.3. Dates of use
     - 3.3.4. Equipment rates at the rental rate listed in Labor Surcharge and Equipment Rental Rates in effect when the affected work related to the claim was performed
4. If a time adjustment is requested:
   - 4.1. Dates for the requested time.
   - 4.2. Reasons for a time adjustment.
   - 4.3. Contract documentation supporting the requested time adjustment.
   - 4.4. TIA. The TIA must demonstrate entitlement to a time adjustment.
5. Identification and copies of your documents and copies of communications supporting the potential claim, including certified payrolls, bills, cancelled checks, job cost reports, payment records, and rental agreements
6. Relevant information, references, and arguments that support the potential claim

NOT FOR CONSTRUCTION

The Department does not consider a *Full and Final Potential Claim Record* that does not have the same nature, circumstances, and basis of claim as those specified on the *Initial Potential Claim Record* and *Supplemental Potential Claim Record*.

The Engineer evaluates the information presented in the *Full and Final Potential Claim Record* and furnishes you a response within 30 days of its receipt unless the *Full and Final Potential Claim Record* is submitted after Contract acceptance, in which case, a response may not be furnished. The Engineer's receipt of the *Full and Final Potential Claim Record* must be evidenced by postal return receipt or the Engineer's written receipt if delivered by hand.

5-1.43E Alternative Dispute Resolution

5-1.43E(1) General

Section 9 and Article 7 of the Draft Contract apply.

5-1.44–5-1.45 RESERVED

5-1.46 FINAL INSPECTION AND CONTRACT ACCEPTANCE

When you complete the work, request the Engineer's final inspection. You will be notified, in writing, of any defects or deficiencies to be remedied. Correct all defects and deficiencies within 5 working days of notification. When notified that the work is completed, the Engineer will again inspect the work to ensure compliance with the Contract Documents.

If the Engineer determines that the work is complete, the Engineer recommends to the City Council that the Contract be accepted and the Notice of Completion be recorded to accept the Contract. Immediately after Contract acceptance, you are relieved from:

1. Maintenance and protection duties
2. Responsibility for injury to persons or property or damage to the work occurring after Contract acceptance except as specified in section 6-3.06

5-1.47–5-1.50 RESERVED

NOT FOR CONSTRUCTION

NOT FOR CONSTRUCTION

6 CONTROL OF MATERIALS

6-1 GENERAL

6-1.01 GENERAL

Section 6 includes specifications related to control of materials

6-2 MATERIAL SOURCE

6-2.01 GENERAL

Material incorporated into the work must be new.

6-2.02 MATERIAL SOURCE

Before the preconstruction conference, submit material source information on a Caltrans *Notice of Materials to Be Used* form.

6-2.03 DEPARTMENT-FURNISHED MATERIALS

Request Department-furnished material except sign panels at least 15 days before their scheduled installation. Request sign panels at least 30 days before their scheduled installation.

If the Department furnishes the material:

1. At the job site, unload and store the material
2. At a location other than the job site, deliver the material to the job site and store it

The Engineer orders the return and disposal of surplus Department-furnished material. This returning and disposing of material is change order work.

You are responsible for the cost of replacing Department-furnished material. The Department deducts replacement costs. Department-furnished material not used in the work remains the property of the Department.

6-2.04 LOCAL MATERIALS

Local material must be:

1. Mineral material, including rock, sand, or gravel, or earth
2. Selected material or material procured from an established commercial source and not local borrow
3. Procured or produced from a source in the work vicinity specifically for project use

Upon your request, the Department tests material from an untested local source. If satisfactory material from that source is used in the work, the Department does not charge you for the tests; otherwise, the Department deducts test costs.

6-2.05 BUY AMERICA

6-2.05A General

Reserved

6-2.05B Crumb Rubber (Pub Res Code § 42703(D))

Furnish crumb rubber with a certificate of compliance. Crumb rubber must be:

1. Produced in the U.S
2. Derived from waste tires taken from vehicles owned and operated in the U.S

6-2.05C Steel and Iron Materials

Steel and iron materials must be melted and manufactured in the United States except:

1. Foreign pig iron and processed, pelletized, and reduced iron ore may be used in the domestic production of the steel and iron materials
2. If the total combined cost of the materials does not exceed the greater of 0.1 percent of the total bid or $2,500, materials produced outside the United States may be used if authorized

NOT FOR CONSTRUCTION

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.

6-3 QUALITY

6-3.01 GENERAL

Store materials and samples in a way that preserves the quality and facilitates prompt inspection.

6-3.02 SPECIFIC BRAND OR TRADE NAME AND SUBSTITUTION

A reference to a specific brand or trade name establishes a quality standard and is not intended to limit competition. You may use a product that is equal to or better than the specified brand or trade name if authorized.

Submit a substitution request with a time period that:

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

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

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

6-3.03 AUTHORIZED LABORATORY LISTS

Section 6-3.03 applies where an authorized laboratory is specified to be on an Authorized Laboratory List.

For procedures to be included on an Authorized Laboratory List, go to the METS Web site.

6-3.04 QUALITY CONTROL

Material production and testing equipment must measure accurately and precisely.

Prepare and maintain QC records, including:

1. Inspection types, results, and dates
2. Testing types, results, and dates
3. Inspector names and certificates
4. Acceptance criteria
5. Corrective actions

6-3.05 QUALITY ASSURANCE

6-3.05A General

The Department may use multiple QA methods for a material.

Allow the Department to record, including photograph and video record, to ensure a material is produced to comply with the Contract.

You may examine the records and reports of tests the Department performs if they are available at the job site.

Schedule work to allow time for QA.

The Department deducts testing costs for work that does not comply with the Contract.

NOT FOR CONSTRUCTION

The Department may retest material previously tested and authorized for use. If the Department notifies you of a retest, furnish resources for retesting.

For a material specified to comply with a State Specification number, the material may comply with a later version of the specification. Obtain State Specifications from METS.

For a material specified to comply with a property shown in the following table, the Department tests under the corresponding California Test shown:

California Tests

Property	California Test
Relative compaction	216 or 231
Sand equivalent	217
Resistance (R-value)	301
Grading (sieve analysis)	202
Durability index	229

NOT FOR CONSTRUCTION

6-3.05B Source Inspection Expense Deductions

For each item shown in the following table, the Department deducts the corresponding amount shown:

Source Inspection Expense Deductions

Item	Distance[a]	Deduction
Steel pipe piling Prestressing system Precast concrete members specified as tier 1 or tier 2 in section 90-4.01D(1) Epoxy-coated reinforcement Structural steel for sign structures Miscellaneous metal	> 300 > 3,000	$5,000 $8,000
Extinguishable message signs Variable message signs Changeable message signs Service equipment enclosures Telephone demarcation cabinets Closed circuit television cabinets Weigh-in-motion cabinets Highway advisory radio cabinets	> 300	$2,000
Poles for electrical systems	> 300	$1,000 for ≤10 poles and $1,000 for every multiple of 10 poles thereafter
Structural steel	> 300 > 3,000	The greater of: 1. $5,000 2. $0.02/lb The greater of: 1. $8,000 2. $0.036/lb
Structural steel paint	> 300 > 3,000	The greater of: 1. $2,000 2. $0.01/sq ft The greater of: 1. $5,000 2. $0.015/sq ft
Check samples	> 300	$2,000
High mast poles	> 300 > 3,000	$2,500 $5,000
PTFE bearings, ≤ 2 lots	> 300 > 3,000	$5,000 $15,000
PTFE bearings, > 2 lots	> 300 > 3,000	$10,000 $20,000

[a]Distance is air-line miles from both Sacramento and Los Angeles to the inspection source.

NOT FOR CONSTRUCTION

6-3.05C Material Source Inspection and Testing

Section 6-3.05C applies if a material is to be inspected or tested at the source.

Submit an inspection request form:

1. At least 3 business days before the requested inspection date for a material source within California.
2. At least 5 business days before the requested inspection date for a material source outside California but within the U.S.
3. 50 days before the planned production start for a material source outside the U.S. Notify the Engineer at least 20 days before the actual start.

For the inspection request form and the procedure for its submittal, go to the METS Web site. Notify the Engineer of each submittal.

6-3.05D Job Site Inspection and Testing

Section 6-3.05D applies if a material is to be inspected or tested at the job site.

The material must be authorized for use before it is incorporated into the work.

6-3.05E Certificates of Compliance

Section 6-3.05E applies (1) where a certificate of compliance is specified and (2) if any material is produced outside the U.S.

Submit a certificate:

1. Before the material is incorporated into the work.
2. For each lot of the material. Identify the lot on the certificate.
3. Signed by the producer of the material and stating that the material complies with the Contract.

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

Reserved

6-3.05G Test Samples

Section 6-3.05G applies where a test sample is specified or if a test sample is requested.

Notify the Engineer 10 days before taking a sample.

Submit material to be tested with a *Sample Identification Card*. For the card, go to the METS Web site.

Restore work immediately after sampling.

6-3.05H Reserved

6-3.05I Authorized Facility Audit Lists

Section 6-3.05I applies where a facility is specified to be on an Authorized Facility Audit List.

An audit authorized by the Department not more than 3 years before completion of the fabrication process is acceptable if the Department determines the audit was for the same type of work to be performed. For procedures to be included on an Authorized Facility Audit List, go to the METS Web site.

6-3.05J Quality Control Plans

Reserved

6-3.05K Authorized Material Lists

Section 6-3.05K applies where a material is specified to be on an Authorized Material List.

The material must be on an Authorized Material List before it is incorporated into the work.

For procedures to be included on an Authorized Material List, go to the METS Web site.

6-3.05L Authorized Material Source Lists

Section 6-3.05L applies where a material is specified to be on an Authorized Material Source List.

The material source must be on an Authorized Material Source List before the item from the source is incorporated into the work.

For procedures to be included on an Authorized Material Source List, go to the METS Web site.

6-3.06 GUARANTEE

Guarantee that work remains free from substantial defects for 1 year after Contract acceptance except for work portions for which you were relieved of maintenance and protection. Guarantee each of these relieved work portions for 1 year after the relief date.

The guarantee excludes damage or displacement caused by an event outside your control, including:

1. Normal wear and tear

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2. Improper operation
3. Insufficient maintenance
4. Abuse
5. Unauthorized change
6. Act of God

During the guarantee period, repair or replace each work portion having a substantial defect.

The Department does not pay for corrective work.

During corrective work activities, provide the same insurance specified before Contract acceptance.

The Contract bonds must be in force until the later of:

1. Expiration of guarantee period
2. Completion of corrective work

If a warranty specification conflicts with section 6-3.06, comply with the warranty specification.

During the guarantee period, the Engineer monitors the completed work. If the Engineer finds work having a substantial defect, the Engineer lists work parts and furnishes you the list.

Within 10 days of receipt of the list, submit for authorization a detailed plan for correcting the work. Include a schedule that includes:

1. Start and completion dates
2. List of labor, equipment, materials, and any special services you plan to use
3. Work related to the corrective work, including traffic control and temporary and permanent pavement markings

The Engineer notifies you when the plan is authorized. Start corrective work and related work within 15 days of notice.

If the Engineer determines corrective work is urgently required to prevent injury or property damage:

1. The Engineer furnishes you an order to start emergency repair work and a list of parts requiring corrective work
2. Mobilize within 24 hours and start work
3. Submit a corrective work plan within 5 business days of starting emergency repair work

If you fail to perform work as specified, the Department may perform the work and bill you.

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7 LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC

7-1.01 GENERAL

Section 7 includes specifications regarding your:

1. Compliance with laws
2. Responsibilities for public safety and convenience
3. Responsibilities for indemnification, insurance, and liability

7-1.02 LAWS

7-1.02A General

Comply with laws, regulations, orders, and decrees applicable to the project. Indemnify and defend the State against any claim or liability arising from the violation of a law, regulation, order, or decree by you or your employees. Immediately report to the Engineer a discrepancy or inconsistency between the Contract and a law, regulation, order, or decree.

If the Department incurs any fines or penalties because of your failure to comply with a law, regulation, order, or decree, the Department deducts the amount of the fine or penalty.

Immediately notify the Engineer if a regulatory agency requests access to the job site or to records. Submit a list of documents provided to the agency and issued enforcement actions.

7-1.02B U.S. Fair Labor Standards Act

Comply with 29 USC § 201 et seq.

7-1.02C Emissions Reduction

Submit to the Department the following certification before performing the work

> I am aware of the emissions reduction regulations being mandated by the California Air Resources Board. I will comply with such regulations before commencing the performance of the work and maintain compliance throughout the duration of this Contract.

Contract signing constitutes submittal of this certification.

7-1.02D–7-1.02H Reserved

7-1.02I Government Code

7-1.02I(1) General

Reserved

7-1.02I(2) Nondiscrimination

Under 2 CA Code Regs §§ 8107 and 8203

1. During the performance of this contract, contractor and its subcontractors shall not unlawfully discriminate against any employee or applicant for employment because of race, religion, color, national origin, ancestry, physical handicap, medical condition, marital status, age (over 40) or sex. Contractors and subcontractors shall insure that the evaluation and treatment of their employees and applicants for employment are free of such discrimination. Contractors and subcontractors shall comply with the provisions of the Fair Employment and Housing Act (Gov. Code, Section 12900 et seq.) and the applicable regulations promulgated thereunder (Cal. Admin. Code, Tit. 2, Section 7285.0 et seq.). The applicable regulations of the Fair Employment and Housing Commission implementing Government Code, Section 12990, set forth in Chapter 5 of Division 4 of Title 2 of the California Administrative Code are incorporated into this contract by reference and made a part hereof as if set forth in full. Contractor and its subcontractors shall give written notice of their obligations under this clause to labor organizations with which they have a collective bargaining or other agreement.
2. This Contractor shall include the nondiscrimination and compliance provisions of this clause in all subcontracts to perform work under the contract.

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

These specifications are applicable to all state contractors and subcontractors having a construction contract or subcontract of $5,000, or more.

1. As used in the specifications:
   a. "Administrator" means Administrator, Office of Compliance Programs, California Department of Fair Employment and Housing, or any person to whom the Administrator delegates authority;
   b. "Minority" includes:
      (i) Black (all persons having primary origins in any of the black racial groups of Africa, but not of Hispanic origin);
      (ii) Hispanic (all persons of primary culture or origin in Mexico, Puerto Rico, Cuba, Central or South America or other Spanish derived culture or origin regardless of race);
      (iii) Asian / Pacific Islander (all persons having primary origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent or the Pacific Islands); and
      (iv) American Indian / Alaskan Native (all persons having primary origins in any of the original peoples of North America and who maintain culture identification through tribal affiliation or community recognition).
2. Whenever the contractor or any subcontractor subcontracts a portion of the work, it shall physically include in each subcontract of $5,000 or more the nondiscrimination clause in this contract directly or through incorporation by reference. Any subcontract for work involving a construction trade shall also include the Standard California Construction Contract Specifications, either directly or through incorporation by reference.
3. The contractor shall implement the specific nondiscrimination standards provided in paragraph 6(a) through (e) of these specifications.
4. Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the contractor's obligations under these specifications, Government Code, Section 12990, or the regulations promulgated pursuant thereto.
5. In order for the nonworking training hours of apprentices and trainees to be counted, such apprentices and trainees must be employed by the contractor during the training period, and the contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor or the California Department of Industrial Relations.
6. The contractor shall take specific actions to implement its nondiscrimination program. The evaluation of the contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The contractor must be able to demonstrate fully its efforts under Steps a. through e. below:
   a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and at all facilities at which the contractor's employees are assigned to work. The contractor, where possible, will assign two or more women to each construction project. The contractor shall specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the contractor's obligations to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.
   b. Provide written notification within seven days to the director of DFEH when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.
   c. Disseminate the Contractor's equal employment opportunity policy by providing notice of the policy to unions and training, recruitment and outreach programs and requesting their cooperation in assisting the Contractor to meet its obligations; and by posting the company policy on bulletin boards accessible to all employees at each location where construction work is performed.

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d. Ensure all personnel making management and employment decisions regarding hiring, assignment, layoff, termination, conditions of work, training, rates of pay or other employment decisions, including all supervisory personnel, superintendents, general foremen, on-site foremen, etc., are aware of the Contractor's equal employment opportunity policy and obligations, and discharge their responsibilities accordingly.
e. Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the equal employment opportunity policy and the Contractor's obligations under these specifications are being carried out.

7. Contractors are encouraged to participate in voluntary associations which assist in fulfilling their equal employment opportunity obligations. The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under these specifications provided that the contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female workforce participation, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's.
8. The Contractor is required to provide equal employment opportunity for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the Contractor may be in violation of the Fair Employment and Housing Act (Gov. Code, Section 12990 et seq.) if a particular group is employed in a substantially disparate manner.
9. Establishment and implementation of a bona fide affirmative action plan pursuant to Section 8104 (b) of this Chapter shall create a rebuttal presumption that a contractor is in compliance with the requirements of Section 12990 of the Government Code and its implementing regulations.
10. The Contractor shall not use the nondiscrimination standards to discriminate against any person because of race, color, religion, sex, national origin, ancestry, physical handicap, medical condition, marital status or age over 40.
11. The Contractor shall not enter into any subcontract with any person or firm decertified from state contracts pursuant to Government Code Section 12990.
12. The Contractor shall carry out such sanctions and penalties for violation of these specifications and the nondiscrimination clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Government Code Section 12990 and its implementing regulations by the awarding agency. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Government Code Section 12990.
13. The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company equal employment opportunity policy is being carried out, to submit reports relating to the provisions hereof as may be required by OCP and to keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status, (e.g., mechanic, apprentice trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in any easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.

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7-1.02J Reserved

7-1.02K Labor Code

7-1.02K(1) General

Work on the job site must comply with Labor Code §§ 1727 and 1770–1815 and 8 CA Code of Regs § 16000 et seq. Work includes roadside production and processing of materials.

Payroll records include time cards, cancelled checks, cash receipts, trust fund forms, books, documents, schedules, forms, reports, receipts or other information which reflect job assignments, work schedules by days and hours, and the disbursement of payment to workers (8 CA Code of Regs § 16000).

7-1.02K(2) Wages

The Department obtains the general prevailing rate of wages applicable to the work to be done. The rate includes:

1. Basic hourly rate
2. Employer payments for health and welfare, pension, vacation, apprenticeship training fees, travel time, and subsistence pay as provided for in Labor Code § 1773.1
3. Similar purposes

The general prevailing wage rates and any applicable changes to these wage rates are available from the Department of Industrial Relations' Web site http://www.dir.ca.gov/.

For a federal-aid contract, federal wage rate determinations are attached to the contract or available at

http://wdol.gov/dba.aspx

Post the general prevailing wage rates at a prominent place at the job site (Labor Code § 1773.2).

If the minimum wage rates as determined by the United States Secretary of Labor differs from the general prevailing wage rates determined by the Director of the California Department of Industrial Relations for similar classifications of labor, you and your subcontractors must not pay less than the higher wage rate.

The wage determinations refer to expiration dates. The determinations with a single asterisk after the expiration date, and in effect on the date of advertisement for bids, are good for the life of the Contract. The determinations with double asterisks after the expiration date indicate the wage rate to be paid for work performed after this date has been determined. If work is to extend past this date, pay the new rate and incorporate it into the Contract. Changes in general prevailing wage determinations apply to the Contract when the Director of Industrial Relations has issued them at least 10 days before advertisement. (Labor Code § 1773.6 and 8 CA Code of Regs 16204)

The Department does not recognize any claim for additional payment because of a payment by the Contractor of any wage rate in excess of the prevailing wage rate specified in the Contract.

The Contractor and any subcontractor must forfeit to the Department not more than $200 per day or part of a day for each worker paid less than the prevailing wage rate and pay the worker the difference between the prevailing wage rate and the rate paid (Labor Code § 1775). The Labor Commissioner determines the amount of this penalty and bases the amount on:

1. Whether the failure to pay the correct prevailing wage rate was a good-faith mistake that the Contractor or subcontractor promptly and voluntarily corrected upon notice
2. The prior record of the Contractor or subcontractor in meeting its prevailing wage obligations
3. The Contractor or subcontractor's willful failure to pay the correct rate of prevailing wages

If a worker employed by a subcontractor on a public works project is not paid the general prevailing per diem wages by the subcontractor, the Contractor is not liable for the penalties described in section 7-1.02K(2) unless the Contractor had knowledge of the failure to pay the correct general prevailing per diem wages or unless the Contractor fails to comply with the following requirements (Labor Code § 1775):

1. The contract executed between the Contractor and the subcontractor for the performance of work on the public works project must include a copy of the requirements in Labor Code §§ 1771, 1775, 1776, 1777.5, 1813 and 1815.
2. The Contractor must monitor the payment of the specified general prevailing rate of per diem wages by periodic review of the certified payroll records of the subcontractor.
3. Upon becoming aware of the subcontractor's failure to pay the specified prevailing rate of wages to the subcontractor's workers, the Contractor must diligently take corrective action to stop or rectify the failure, including withholding sufficient funds due the subcontractor for work performed on the public works project.
4. Before making final payment to the subcontractor for work performed on the public works project, the Contractor must obtain an affidavit signed under penalty of perjury from the subcontractor that the subcontractor has paid the specified general prevailing rate of per diem wages to its employees on the public works project and any amounts due under Labor Code § 1813.

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Under Labor Code § 1775, the Department must notify the contractor on a public works project within 15 days of receipt by the Department of a complaint of the failure of a subcontractor on that public works project to pay workers the general prevailing rate of per diem wages.

7-1.02K(3) Certified Payroll Records (Labor Code § 1776)

Keep accurate payroll records.

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

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

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

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

The Department allows the use of a form with identical wording as the *Statement of Compliance* form provided by the Department.

You may submit certified payroll records to the Engineer.

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

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

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

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

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

Comply with a request for the records within 10 days after you receive a written request. If you do not comply within this period, the Department withholds from progress payments a $100 penalty for each day

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or part of a day for each worker until you comply. You are not assessed this penalty for a subcontractor's failure to comply with Labor Code § 1776.

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

7-1.02K(4) Apprentices

Comply with the apprentice to journeyman ratio requirements (Labor Code § 1777.5(g)).

Comply with the training contribution requirements (Labor Code § 1777.5(m)(1)).

For answers to questions, contact the Division of Apprenticeship Standards before starting work.

The Department deducts from progress payments civil penalties assessed by the Chief of the Division of Apprenticeship Standards for violating Labor Code § 1777.5 (Labor Code § 1777.7).

7-1.02K(5) Working Hours

Eight hours is a legal day's work (Labor Code § 1810.

The time of service of any worker employed on public work is limited and restricted to 8 hours in 1 day and 40 hours in 1 calendar week, except as provided by Labor Code § 1815 (Labor Code § 1811).

A Contractor's employee may work more than 8 hours per day and 40 hours per week if the Contractor pays the employee 1-1/2 times the basic pay rate for the hours worked in excess of 8 hours per day and 40 hours per week (Labor Code § 1815).

For each worker employed in the work for each day the worker works more than 8 hours in 1 day and 40 hours in 1 calendar week without overtime pay, the Department deducts $25 as a penalty for violating Labor Code § 1815 (Labor Code § 1813).

7-1.02K(6) Occupational Safety and Health Standards

7-1.02K(6)(a) General

Comply with applicable occupational safety and health standards, rules, regulations, and orders. The Occupational Safety and Health Standards Board is the only agency authorized in the State to adopt and enforce occupational safety and health standards (Labor Code § 142 et seq.).

You are the controlling employer and must ensure hazardous conditions are corrected (Labor Code § 6400).

The Engineer may notify Cal/OSHA if you fail to establish or maintain a safe and healthful workplace.

Submit copies of your Injury and Illness Prevention Program and permits required by Cal/OSHA. The program must address the use of personal and company-issued electronic devices during work. Do not allow the use of entertainment and personal communication devices in the work zone. Workers may use a communication device for business purposes in the work area, at a location where their safety and the safety of other workers and the traveling public is not compromised.

7-1.02K(6)(b) Excavation Safety

Comply with Labor Code § 6705 while excavating. For an excavation 5 feet or more in depth, submit shop drawings for a protective system.

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The drawings must show the design and details for providing worker protection from caving ground during excavation. The submittal must allow review time and include the contents shown in the following table except the review time is 65 days for an excavation on or affecting railroad property:

Drawing Review Time and Contents

	Plan not requiring a signature	Plan requiring a signature
Review time	5 business days before excavating	20 days before excavating
Contents	Drawings Calculations Material information Proprietary system information	Drawings Calculations Material information Proprietary system information Soil classification Soil properties Soil design calculations

7-1.02K(6)(c) Tunnel Safety

Cal/OSHA classifies tunnels into one of the following classifications:

1. Nongassy
2. Potentially gassy
3. Gassy
4. Extrahazardous

If a tunnel location is described in the Contract, the classification is included in the *Information Handout* and you must:

1. Designate an on-site Safety Representative under 8 CA Code of Regs § 8406
2. Submit the name of your on-site Safety Representative at least 7 days before starting work at each tunnel
3. Prominently post a notice at the job site of:
   3.1. Tunnel classifications
   3.2. Any special orders, rules, special conditions, or regulations related to tunnel work
4. Ensure your workers are informed of these classifications

Notify the Engineer at least 20 days before a worker enters a tunnel not described in the Contract. The Department obtains the classification of the tunnel. The Engineer may suspend the work because of a change directly resulting from the Contractor's planned activities that causes activities to fall under the Tunnel Safety Orders of 8 CA Code of Regs § 8422.

7-1.02K(6)(d) Confined Space Safety

Comply with 8 CA Code of Regs § 5158 while working in a confined space.

7-1.02K(6)(e)–7-1.02K(6)(i) Reserved

7-1.02K(6)(j) Lead Safety

7-1.02K(6)(j)(i) General

Reserved

7-1.02K(6)(j)(ii) Lead Compliance Plan

Section 7-1.02K(6)(j)(ii) applies if the submittal of a lead compliance plan is specified in the special provisions.

Regulations containing specific Cal/OSHA requirements when working with lead include 8 CA Code of Regs § 1532.1.

Submit a plan:

1. That documents your compliance program to prevent or minimize worker exposure to lead
2. Including the items listed in 8 CA Code of Regs § 1532.1(e)(2)(B)

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3. Signed and sealed by a CIH

Allow 7 days for the Engineer's review. Obtain authorization for the plan before starting any activity that presents the potential for lead exposure.

Before starting any activity that presents the potential for lead exposure to employees who have no prior training, including State employees, provide a safety training program to these employees that complies with 8 CA Code of Regs § 1532.1 and your lead compliance plan.

Submit copies of air monitoring or job site inspection reports made by or under the direction of the CIH under 8 CA Code of Regs § 1532.1 within 10 days after the date of monitoring or inspection.

Supply personal protective equipment, training, and washing facilities required by your lead compliance plan for 2 City employees.

7-1.02K(6)(j)(iii–viii) Reserved

7-1.02K(6)(k)–7-1.02K(6)(t) Reserved

7-1.02L Public Contract Code

7-1.02L(1) General

Reserved

7-1.02L(2) Antitrust Claims

In entering into a public works contract or a subcontract to supply goods, services, or materials pursuant to a public works contract, the contractor or subcontractor offers and agrees to assign to the awarding body all rights, title, and interest in and to all causes of action it may have under section 4 of the Clayton Act (15 U.S.C. Sec. 15) or under the Cartwright Act (Chapter 2 (commencing with § 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 acknowledgment by the parties. [Pub Cont Code § 7103.5 (b)]

7-1.02M Public Resources Code

7-1.02M(1) General

Reserved

7-1.02M(2) Reserved

7-1.02M(3) Surface Mining and Reclamation Act

Imported borrow or aggregate material must come from a surface mine permitted under the Surface Mining and Reclamation Act of 1975, Pub Res Code § 2710 et seq., or from a source not subject to this act.

For the list of permitted sites, go to the Department of Conservation, Office of Mine Reclamation Web site.

If you import borrow or aggregate material from a surface mine not on this list, submit proof that the source is not subject to this act.

7-1.02M(4)–7-1.02M(7) Reserved

7-1.02N Reserved

7-1.02O Vehicle Code

Under Veh Code § 591, the Department determines areas within the project limits are open to public traffic. For those areas, comply with the requirements set forth in Divisions 11, 12, 13, 14 and 15 of the Veh Code.

Veh Code § 591 does not relieve you or any other person from the duty of exercising due care.

7-1.02P–7-1.02Q Reserved

7-1.02R Environmental Stewardship

Comply with section 14.

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7-1.02S–7-1.02Z Reserved

7-1.03 PUBLIC CONVENIENCE

Compliance with section 7-1.03 does not relieve you of your responsibility for public safety.

Construction activities must not inconvenience the public or abutting property owners. Schedule and conduct work to avoid unnecessary inconvenience to the public and abutting property owners. Avoid undue delay in construction activities to reduce the public's exposure to construction.

Where possible, route traffic on new or existing paved surfaces.

Maintain convenient access to driveways, houses, and buildings. When an abutting property owner's access across the right-of-way line is to be eliminated or replaced under the Contract, the existing access must not be closed until the replacement access facility is usable. Construct temporary approaches to a crossing and an intersecting highway.

Provide a reasonably smooth and even surface for use by traffic at all time during the excavation of a roadway and construction of an embankment. Before other grading activities, place fill at culverts and bridges to allow traffic to cross. If ordered, excavate a roadway cut in layers and construct an embankment in partial widths at a time alternating construction from one side to the other and routing traffic over the side opposite the one under construction. Install or construct culverts on only 1/2 the width of the traveled way at a time; keep the traveled way portion being used by traffic open and unobstructed until the opposite side of the traveled way is ready for use by traffic.

Upon completion of rough grading or placing any subsequent layer, bring the surface of the roadbed to a smooth and even condition, free of humps and depressions, and satisfactory for the use of the public.

After subgrade preparation for a specified layer of material has been completed, repair any damage to the roadbed or completed subgrade, including damage caused by public use.

While subgrade and paving activities are underway, allow the public to use the shoulders. If half-width paving methods are used, allow the public to use the side of the roadbed opposite the one under construction. If enough width is available, keep open a passageway wide enough to accommodate at least 2 lanes of traffic at locations where subgrade and paving activities are underway. Shape shoulders or reshape subgrade as necessary to accommodate traffic during subgrade preparation and paving activities.

Apply dust palliative for the prevention or alleviation of dust nuisance.

Install signs, lights, flares, Type K temporary railing, barricades and other facilities to direct traffic. Provide flaggers whenever necessary to direct the movement of the public through or around the work.

You are required to pay for the cost of replacing or repairing all facilities installed under change order work for the convenience, direction, or warning of the public that are lost while in your custody or are damaged by your operations to such an extent as to require replacement or repair.

The Engineer may order or consent to your request to open a completed section of surfacing, pavement, or structure roadway surface for public use. You will not be compensated for any delay to your construction activities caused by the public. This does not relieve you from any other contractual responsibility.

7-1.04 PUBLIC SAFETY

You are responsible to provide for public safety.

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

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

Move workers, equipment, and materials without endangering traffic.

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

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

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

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

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

Cover signs that direct traffic to a closed area. Except for work specified in section 12, maintaining, and removing the covers on construction area signs is change order work.

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

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

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

Notify the Engineer not less than 25 days and not more than 125 days before the anticipated start of an activity that will change the vertical or horizontal clearance available to traffic, including shoulders.

If vertical clearance is temporarily reduced to 15.5 feet or less, place low clearance warning signs in compliance with the *California MUTCD* and any directions of the Engineer. Signs must comply with the dimensions, color, and legend requirements of the *California MUTCD* and section 12-3.06 except that the signs must have black letters and numbers on an orange retroreflective background. W12-2P signs must be illuminated so that the signs are clearly visible.

Pave or provide full width continuous and cleared wood walks for pedestrian openings through falsework. Protect pedestrians from falling objects and concrete-curing water. Extend overhead protection for pedestrians at least 4 feet beyond the edge of the bridge deck. Illuminate all pedestrian openings through falsework. Temporary pedestrian facilities must comply with the *California MUTCD*, Part 6, Chapter 6D, "Pedestrian and Worker Safety."

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

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

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

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

NOT FOR CONSTRUCTION

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

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

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

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

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

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

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

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

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

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

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

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

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

NOT FOR CONSTRUCTION

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

7-1.05 INDEMNIFICATION

7-1.05A General

You must defend, indemnify, and save harmless the City, Quincy Engineering, Inc. and, including its officers, employees, and agents (excluding agents who are design professionals), from any and all claims, demands, causes of action, damages, costs, expenses, actual attorneys' fees, losses or liabilities, in law or in equity (Section 7-1.05 Claims) arising out of or in connection with your performance of this Contract for:

1. Bodily injury including, but not limited to, bodily injury, sickness or disease, emotional injury or death to persons, including, but not limited to, the public, any employees or agents of you, the City, Quincy Engineering, Inc., or any other contractor; and
2. Damage to property of anyone including loss of use thereof; caused or alleged to be caused in whole or in part by any negligent or otherwise legally actionable act or omission of you or anyone directly or indirectly employed by you or anyone for whose acts you may be liable.

Except as otherwise provided by law, these requirements apply regardless of the existence or degree of fault of the City and Quincy Engineering, Inc. You are not obligated to indemnify the City and Quincy Engineering, Inc., for Claims arising from conduct delineated in Civ Code § 2782 and for Claims arising from any defective or substandard condition of the highway that existed at or before the start of work, unless this condition has been changed by the work or the scope of the work requires you to maintain existing highway facilities and the Claim arises from your failure to maintain. Your defense and indemnity obligation shall extend to Claims arising after the work is completed and accepted if the Claims are directly related to alleged acts or omissions by you that occurred during the course of the work. Any inspection of the work by the City, and Quincy Engineering, Inc., is not a waiver of full compliance with these requirements.

Your obligation to defend and indemnify is not excused because of your inability to evaluate liability or because you evaluate liability and determine that you are not liable. You must respond within 30 days to the tender of any Claim for defense and indemnity by the City and Quincy Engineering, Inc., unless this time has been extended by the City and Quincy Engineering, Inc. If you fail to accept or reject a tender of defense and indemnity within 30 days, in addition to any other remedy authorized by law, the Department may withhold such funds the City reasonably considers necessary for its defense and indemnity until disposition has been made of the Claim or until the Contractor accepts or rejects the tender of defense, whichever occurs first.

With respect to third-party claims against you, you waive all rights of any type to express or implied indemnity against the City and Quincy Engineering, Inc., its officers, employees, or agents (excluding agents who are design professionals).

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

7-1.05B Responsibility to Other Entities

You are responsible for any liability imposed by law and for injuries to or death of any person, including workers and the public, or damage to property. Indemnify and save harmless any county, city or district and its officers and employees connected with the work, within the limits of which county, city, or district the work is being performed, all in the same manner and to the same extent specified for the protection of the City.

7-1.06 INSURANCE

7-1.06A General

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

7-1.06B Casualty Insurance

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

NOT FOR CONSTRUCTION

1. Keep all insurance in full force and effect from the start of the work through Contract acceptance.
2. All insurance must be with an insurance company with a rating from A.M. Best Financial Strength Rating of A- or better and a Financial Size Category of VII or better.
3. Maintain completed operations coverage with a carrier acceptable to the City through the expiration of the patent deficiency in construction statute of repose set forth in Civ Pro Code § 337.15.

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

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

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

> I am aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the work of this contract.

Contract signing constitutes certification submittal.

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

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

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

7-1.06D Liability Insurance

7-1.06D(1) General

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

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

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

The limits of liability must be at least the values shown in the following table:

Liability Limits

Total bid	For each occurrence[a]	Aggregate for products/completed operation	General aggregate[b]	Umbrella or excess liability[c]
≤ $1,000,000	$1,000,000	$2,000,000	$2,000,000	$5,000,000
> $1,000,000 ≤ $10,000,000	$1,000,000	$2,000,000	$2,000,000	$10,000,000
> $10,000,000 ≤ $25,000,000	$2,000,000	$2,000,000	$4,000,000	$15,000,000
> $25,000,000	$2,000,000	$2,000,000	$4,000,000	$25,000,000

[a]Combined single limit for bodily injury and property damage.
[b]This limit must apply separately to your work under this Contract.
[c]The umbrella or excess policy must contain a clause stating that it takes effect (drops down) in the event the primary limits are impaired or exhausted.

NOT FOR CONSTRUCTION

Do not require a small business subcontractor to carry liability insurance that exceeds the limits shown in the preceding table. For a small business subcontractor, interpret "Total Bid" in the table as the dollar amount of subcontracted work.

As used in section 7-1.06D(2), a small business:

1. For a non-federal-aid contract is defined in 2 CA Code of Regs § 1896 and is incorporated by this reference
2. For a federal-aid contract is defined in 13 CFR 121.201 and is incorporated by this reference

The City, including its officers, directors, agents (excluding agents who are design professionals), and employees, must be named as additional insureds under the General Liability and Umbrella Liability Policies with respect to liability arising out of or connected with work or operations performed by or on behalf of you under this Contract. Coverage for such additional insureds does not extend to liability:

1. Arising from any defective or substandard condition of the roadway which existed at or before the time you started work, unless such condition has been changed by the work or the scope of the work requires you to maintain existing roadway facilities and the claim arises from your failure to maintain;
2. For claims occurring after the work is completed and accepted unless these claims are directly related to alleged acts or omissions of you that occurred during the course of the work; or
3. To the extent prohibited by Ins Code § 11580.04.

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

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

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

7-1.06D(4) Professional Liability

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

7-1.06E Automobile Liability Insurance

Carry automobile liability insurance, including coverage for all owned, hired, and nonowned automobiles. The primary limits of liability must be not less than $1,000,000 combined single limit each accident for bodily injury and property damage. The umbrella or excess liability coverage required under section 7-1.06D(2) also applies to automobile liability.

7-1.06F Policy Forms, Endorsements, and Certificates

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

7-1.06G Deductibles

The City may expressly allow deductible clauses, which it does not consider excessive, overly broad, or harmful to the interests of the City. Regardless of the allowance of exclusions or deductions by the City, you are responsible for any deductible amount and must warrant that the coverage provided to the City complies with section 7-1.06.

7-1.06H Enforcement

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

NOT FOR CONSTRUCTION

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

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

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

7-1.06I Self-Insurance

Self-insurance programs and self-insured retentions in insurance policies are subject to separate annual review and approval by the City.

If you use a self-insurance program or self-insured retention, you must provide the City with the same protection from liability and defense of suits as would be afforded by first-dollar insurance. Execution of the Contract is your acknowledgment that you will be bound by all laws as if you were an insurer as defined under Ins Code § 23 and that the self-insurance program or self-insured retention shall operate as insurance as defined under Ins Code § 22.

7-1.07 LEGAL ACTIONS AGAINST THE DEPARTMENT

7-1.07A General

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

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

7-1.07B Seal Coat Claims

Not Used

7-1.08 PERSONAL LIABILITY

Neither the Director, the Engineer nor any other officer or authorized employee of the State of California, nor any officer or employee of any county, city or district shall be personally responsible for any liability arising under or by virtue of the Contract.

7-1.09–7-1.10 RESERVED

7-1.11 FEDERAL LAWS FOR FEDERAL-AID CONTRACTS

7-1.11A General

Section 7-1.11 includes specifications required in a federal-aid construction contract and applies to a federal-aid contract.

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:

NOT FOR CONSTRUCTION

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.

7-1.11B FHWA-1273

NOT FOR CONSTRUCTION

REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS

I. General
II. Nondiscrimination
III. Nonsegregated Facilities
IV. Davis-Bacon and Related Act Provisions
V. Contract Work Hours and Safety Standards Act Provisions
VI. Subletting or Assigning the Contract
VII. Safety: Accident Prevention
VIII. False Statements Concerning Highway Projects
IX. Implementation of Clean Air Act and Federal Water Pollution Control Act
X. Compliance with Governmentwide Suspension and Debarment Requirements
XI. Certification Regarding Use of Contract Funds for Lobbying

ATTACHMENTS

A. Employment and Materials Preference for Appalachian Development Highway System or Appalachian Local Access Road Contracts (included in Appalachian contracts only)

I. GENERAL

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under Title 23 (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services).

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services). The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Contracting agencies may reference Form FHWA-1273 in bid proposal or request for proposal documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract).

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors.

II. NONDISCRIMINATION

The provisions of this section related to 23 CFR Part 230 are applicable 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 contacting 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.

7-1.11C Female and Minority Goals

To comply with section II, "Nondiscrimination," of "Required Contract Provisions Federal-Aid Construction Contracts," the Department is including in section 7-1.11C 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.

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The goals for minority utilization [45 Fed Reg 65984 (10/3/1980)] are as shown in the following table:

Minority Utilization Goals

	Economic area	Goal (Percent)
174	Redding CA: Non-SMSA Counties: CA Lassen; CA Modoc; CA Plumas; CA Shasta; CA Siskiyou; CA Tehama	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 7360 San Francisco-Oakland CA Alameda; CA Contra Costa; CA Marin; CA San Francisco; CA San Mateo 7400 San Jose, CA CA Santa Clara, CA 7485 Santa Cruz, CA CA Santa Cruz 7500 Santa Rosa CA Sonoma 8720 Vallejo-Fairfield-Napa, CA CA Napa; CA Solano Non-SMSA Counties: CA Lake; CA Mendocino; CA San Benito	 28.9 25.6 19.6 14.9 9.1 17.1 23.2
177	Sacramento, CA: SMSA Counties: 6920 Sacramento, CA CA Placer; CA Sacramento; CA Yolo Non-SMSA Counties CA Butte; CA Colusa; CA El Dorado; CA Glenn; CA Nevada; CA Sierra; CA Sutter; CA Yuba	 16.1 14.3
178	Stockton-Modesto, CA: SMSA Counties: 5170 Modesto, CA CA Stanislaus 8120 Stockton, CA CA San Joaquin Non-SMSA Counties CA Alpine; CA Amador; CA Calaveras; CA Mariposa; CA Merced; CA Tuolumne	 12.3 24.3 19.8
179	Fresno-Bakersfield, CA SMSA Counties: 0680 Bakersfield, CA CA Kern 2840 Fresno, CA CA Fresno Non-SMSA Counties: CA Kings; CA Madera; CA Tulare	 19.1 26.1 23.6

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180	Los Angeles, CA: SMSA Counties: 0360 Anaheim-Santa Ana-Garden Grove, CA CA Orange 4480 Los Angeles-Long Beach, CA CA Los Angeles 6000 Oxnard-Simi Valley-Ventura, CA CA Ventura 6780 Riverside-San Bernardino-Ontario, CA CA Riverside; CA San Bernardino 7480 Santa Barbara-Santa Maria-Lompoc, CA CA Santa Barbara Non-SMSA Counties CA Inyo; CA Mono; CA San Luis Obispo	 11.9 28.3 21.5 19.0 19.7 24.6
181	San Diego, CA: SMSA Counties 7320 San Diego, CA CA San Diego Non-SMSA Counties CA Imperial	 16.9 18.2

For each July during which work is performed under the Contract, you and each non-material-supplier subcontractor with a subcontract of $10,000 or more must complete Form FHWA PR-1391 (Appendix C to 23 CFR 230). Submit the forms by August 15.

7-1.11D Training

Section 7-1.11D applies if a number of trainees or apprentices is shown on the *Notice to Bidders*.

As part of your equal opportunity affirmative action program, provide on-the-job training to develop full journeymen in the types of trades or job classifications involved.

You have primary responsibility for meeting this training requirement.

If you subcontract a Contract part, determine how many trainees or apprentices are to be trained by the subcontractor.

Where feasible, 25 percent of apprentices or trainees in each occupation must be in their 1st year of apprenticeship or training.

Distribute the number of apprentices or trainees among the work classifications on the basis of your needs and the availability of journeymen in the various classifications within a reasonable recruitment area.

Before starting work, submit:

1. Number of apprentices or trainees to be trained for each classification
2. Training program to be used
3. Training starting date for each classification

Obtain the Department's approval for this submitted information before you start work. The Department credits you for each apprentice or trainee you employ on the work who is currently enrolled or becomes enrolled in an approved program.

The primary objective of section 7-1.11D is to train and upgrade minorities and women toward journeymen status. Make every effort to enroll minority and women apprentices or trainees, such as conducting systematic and direct recruitment through public and private sources likely to yield minority and women apprentices or trainees, to the extent they are available within a reasonable recruitment area. Show that you have made the efforts. In making these efforts, do not discriminate against any applicant for training.

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Do not employ as an apprentice or trainee an employee:

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 U.S. 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 Department and FHWA approves a program if one of the following is met:

1. It is calculated to:
   1.1. Meet 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 Department 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 FHWA 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 Department 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 under a federal-aid contract 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 section 7-1.11D

Each apprentice or trainee must:

1. Start training on the project as soon as feasible after the start of work involving the apprentice's or trainee's craft
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 section 7-1.11D.

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8 PROSECUTION AND PROGRESS

8-1.01 GENERAL

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

8-1.02 SCHEDULE

8-1.02A General

Upon completion of all work, the Department returns the withholds associated with section 8-1.02 and makes a payment adjustment for work not performed in the same manner as work-character changes.

8-1.02B Level 1 Critical Path Method Schedule

8-1.02B(1) General

Section 8-1.02B applies to a contract with a total bid less than $1 million and less than 100 original working days.

Before or at the preconstruction conference, submit a CPM baseline schedule.

For each schedule submittal:

1. Submit a plotted original, time-scaled network diagram on a sheet at least 8-1/2 by 11 inches with a title block and timeline
2. If a computer program is used to make the schedule, submit a read-only compact disc or other Engineer-authorized data-storage device containing the schedule data. Label the data storage device with:
   2.1. Contract number
   2.2. CPM schedule number and date produced
   2.3. File name

8-1.02B(2) Schedule Format

On each schedule, show:

1. Planned and actual start and completion date of each work activity, including applicable:
   1.1. Submittal development
   1.2. Submittal review and acceptance
   1.3. Material procurement
   1.4. Contract milestones and constraints
   1.5. Equipment and plant setup
   1.6. Interfaces with outside entities
   1.7. Erection and removal of falsework and shoring
   1.8. Test periods
   1.9. Major traffic stage change
   1.10. Final cleanup
2. Order that you propose to prosecute the work
3. Logical links between the time-scaled work activities
4. All controlling activities
5. Legible description of each activity
6. At least 1 predecessor and 1 successor to each activity except for project start and project end milestones
7. Duration of at least 1 working day for each activity
8. Start milestone date as the Contract approval date

8-1.02B(3) Updated Schedule

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

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

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

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

8-1.02C Level 2 Critical Path Method Schedule

8-1.02C(1) General

Section 8-1.02C applies to a contract with (1) a total bid less than $1 million and 100 or more original working days, (2) a total bid from $1 to $5 million, or (3) a total bid over $5 million and less than 100 original working days.

Submit baseline, monthly updated, and final updated schedules, each consistent in all respects with the time and order of Contract work requirements. Perform work in the sequence indicated on the current accepted schedule.

Use computer software to prepare each schedule.

You are responsible for assuring that all activity sequences are logical and that each schedule shows a coordinated plan for complete performance of the work.

If the Contract includes construction staging and you propose changes to the described staging, do not perform work affected by the proposed changes until the Engineer accepts your schedule. Changes to the schedule that change described staging is change order work.

The Engineer's review and acceptance of schedules does not void any Contract part and does not void your responsibility for submitting complete and accurate information.

Correct rejected schedules and resubmit them within 7 days of notification by the Engineer. Allow 7 days for the Engineer's review of the resubmittal.

Errors or omissions on schedules do not void your responsibility for completing all work within the time specified for completion of the work.

If either you or the Engineer discovers that any aspect of the schedule has an error or omission after a schedule has been accepted, correct it on the next updated schedule**.**

8-1.02C(2) Schedule Format

For the schedule format, comply with the 1st paragraph of section 8-1.02B(2) and show:

1. Calculations using the CPM to determine controlling activities.
2. Duration activities less than 20 working days.
3. Each required constraint. Constraints other than those required by the specifications may be included only if authorized.

8-1.02C(3) Computer Software

8-1.02C(3)(a) General

Submit a description of your proposed schedule software for authorization.

Software must be compatible with the current version of the Microsoft Windows operating system in use by the Engineer.

The schedule software must include the latest version of Primavera P6 for Windows or equal.

Any proposed schedule software equal to Primavera P6 must be capable of:

1. Generating files that can be imported into Primavera P6
2. Comparing 2 schedules and providing reports of changes in activity ID, activity description, constraints, calendar assignments, durations, and logic ties

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8-1.02C(3)(b) Reserved

8-1.02C(4) Data and Network Diagrams

For each schedule, submit:

1. 1 data-storage device containing the schedule data
2. 2 sets of originally plotted, time-scaled network diagrams

The data-storage device must comply with item 2 of the 3rd paragraph of section 8-1.02B(1).

The time-scaled network diagrams must:

1. Show a continuous flow of information from left to right
2. Be based on early start and early finish dates of activities
3. Clearly show the primary critical path using graphical presentation
4. Be on 11 by 17 inches or larger sheets
5. Include a title block and a timeline on each page

8-1.02C(5) Baseline Schedule

Submit a baseline schedule and all support data within 20 days of Contract approval. Allow 20 days for the Engineer's review after the submittal.

Starting the week the baseline schedule is first submitted, meet with the Engineer weekly to discuss and resolve schedule issues until the baseline schedule is accepted.

The baseline schedule must include the entire scope of work and how you plan to complete all work contemplated.

The baseline schedule must show the activities that define the critical path. Multiple critical paths and near-critical paths must be kept to a minimum. A total of not more than 50 percent of the baseline schedule activities must be critical or near critical unless otherwise authorized.

The baseline schedule must not extend beyond the number of original working days.

8-1.02C(6) Updated Schedule

Each updated schedule must comply with section 8-1.02B(3).

Meet with the Engineer to review work progress on or before the 1st day of each month, starting 1 month after the baseline schedule is accepted.

Allow 15 days for review after the updated schedule and all support data are submitted. The review period does not start until the previous month's required schedule is accepted.

Updated schedules not accepted or rejected within the review period are accepted.

The updated schedule must:

1. Have a data date of the 21st day of the month or other date established by the Engineer
2. Show changes from accepted revised schedules

8-1.02C(7) Final Updated Schedule

Submit a final updated as-built schedule with actual start and finish dates for the activities within 30 days after work completion.

Submit a written certificate with this submittal signed by your project manager or an officer of the company stating:

> "To my knowledge and belief, the enclosed final updated schedule reflects the actual start and finish dates of the actual activities for the project contained herein."

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An officer of the company may delegate in writing the authority to sign the certificate to a responsible manager.

8-1.02D Level 3 Critical Path Method Schedule

Not Used.

8-1.02E–8-1.02F Reserved

8-1.03 PRECONSTRUCTION CONFERENCE

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

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

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

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Before work can begin on a subcontract, you must submit a completed "Subcontracting Request", Exhibit 16-B of the Caltrans Local Assistance Procedures Manual (LAPM) or equivalent. When the Engineer receives the completed form it will be checked for agreement of the first tier subcontractors and DBE's. The Engineer will not approve the request when it identifies someone other than the DBE or first tier subcontractor listed in the previously completed "LOCAL AGENCY BIDDER – DBE INFORMATION" form. The "Subcontracting Request" will not be approved until any discrepancies are resolved. If an issue cannot be resolved at that time, or there is some other concern, the Engineer will require the Contractor to eliminate the subcontractor in question before signing the subcontracting request. A change in the DBE or first tier subcontractor may be addressed during a substitution process at a later date.

Suppliers, vendors, or manufacturers listed on the "LOCAL AGENCY BIDDER – DBE INFORMATION" form will be compared to those listed in the completed Exhibit 16-I "Notice of Materials to be Used", of the LAPM or equivalent. Differences must be resolved by either making corrections or requesting a substitution.

Substitutions will be subject to the Subletting and Subcontracting Fair Practices Act (FPA). The Department will require Contractors to adhere to the provisions within Subletting and Subcontracting Fair Practices Act (State Law) Sections 4100-4114. FPA requires the Contractor to list all subcontractors in excess of one half of one percent (0.5%) of the Contractor's total bid or $10,000, whichever is greater.

The statute is designed to prevent bid shopping by Contractors. The FPA explains that a Contractor may not substitute a subcontractor listed in the original bid except with the approval of the awarding authority.

8-1.04 START OF JOB SITE ACTIVITIES

8-1.04A General

Reserved

8-1.04B Standard Start

Start job site activities on the date stated in the Notice to Proceed.

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

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

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

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

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

The Department does not adjust time for starting before receiving notice of Contract approval.

8-1.04C Delayed Start

Reserved

8-1.04D Early Return-Early Start

Reserved

8-1.04E Next-Day Start

Reserved

8-1.04F–8-1.04J Reserved

8-1.05 TIME

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.

Complete the work within the Contract time stated in the Notice to Bidders.

Meet each specified interim work completion date.

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

The *Weekly Statement of Working Days* shows:

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

8-1.06 SUSPENSIONS

The Engineer may suspend work wholly or in part due to conditions unsuitable for work progress. Provide for public safety and a smooth and unobstructed passageway through the work zone during the

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suspension as specified under sections 7-1.03 and 7-1.04. Providing the passageway is force account work. The Department makes a time adjustment for the suspension due to a critical delay.

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

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

8-1.07 DELAYS

8-1.07A General

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

8-1.07B Time Adjustments

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

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

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

If the Engineer requests, update the schedule to the last working day before the start of the delay.

8-1.07C Payment Adjustments

For an excusable delay that affects your costs, the Department may make a payment adjustment.

Only losses for idle equipment, idle workers, and equipment moving or transporting are eligible for delay-related payment adjustments.

The Engineer determines payment for idle time of equipment in the same manner as determinations are made for equipment used in the performance of force account work under section 9-1.04 with the following exceptions:

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

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

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

The Department does not make a payment adjustment for overhead incurred during non–working days that extend the Contract into an additional construction season.

8-1.08–8-1.09 RESERVED

8-1.10 LIQUIDATED DAMAGES

8-1.10A General

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

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

Liquidated damages for all work except plant establishment are as shown in the following table:

Liquidated Damages

Total bid		Liquidated damages
From over	To	per day
$0	$50,000	$1,200
$50,000	$120,000	$1,500
$120,000	$1,000,000	$1,900
$1,000,000	$5,000,000	$3,000
$5,000,000	$10,000,000	$5,400
$10,000,000	$30,000,000	$8,300
$30,000,000	$100,000,000	$10,500
$100,000,000	$250,000,000	$28,500

If all work except plant establishment is complete and the total number of working days have expired, liquidated damages are $950 per day.

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

The Department may deduct specified damages from payments for each day in completing a work part beyond the time specified for completing the work part.

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

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

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

The Department may deduct specified damages from payments for each day in completing a work part beyond the specified completion date for the work part.

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

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

8-1.10D Reserved

8-1.11–8-1.12 RESERVED

8-1.13 CONTRACTOR'S CONTROL TERMINATION

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

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

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

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

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

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

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

8-1.14 CONTRACT TERMINATION

8-1.14A General

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

8-1.14B Relief from Responsibility for Work

Upon receiving a termination notice:

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

8-1.14C Responsibility for Materials

Upon receiving a termination notice, protect unused material until:

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

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

8-1.14D Contract Acceptance after Termination

The Engineer recommends Contract acceptance after determining completion of:

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

The Department pays you under section 9-1.17.

8-1.14E Payment Adjustment for Termination

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

1. Direct cost for the work:
    1.1. Including:
        1.1.1. Mobilization.
        1.1.2. Demobilization.
        1.1.3. Securing the job site for termination.
        1.1.4. Losses from the sale of materials.

NOT FOR CONSTRUCTION

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

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

8-1.15–8-1.16 RESERVED

NOT FOR CONSTRUCTION

9 PAYMENT

9-1.01 GENERAL

Section 9 includes specifications related to work payment

9-1.02 MEASUREMENT

9-1.02A General

The Department determines bid item quantities under U.S. customary units

Except for final pay item quantities, the Engineer measures quantities for payment.

9-1.02B Weighing Equipment and Procedures

9-1.02B(1) General

Measure material quantities for payment with devices that comply with:

1. 4 CA Code of Regs § 4000 et seq.
2. Bus & Prof Code § 12001 et seq.

To determine the material payment quantities, use measuring devices that have been sealed by the Department of Food and Agriculture's Division of Measurement Standards or its designated representative.

If a device is not type approved by the Division of Measurement Standards, type approve it under California Test 109.

Notify the Engineer at least 1 business day in advance of equipment testing.

Use material plant controllers having elements affecting the data accuracy and delivery that have been sealed by the Engineer. Make these elements available to the Engineer for inspection. If the elements are adequate for use, the Engineer seals them. If security seal manipulation occurs, stop material production. Do not resume production until the Engineer reinspects and reseals the device.

Measure material paid for by weight onsealed scales regularly inspected by the Department of Food and Agriculture's Division of Measurement Standards or its designated representative.

Obtain authorization of portable vehicle scale installations before sealing.

9-1.02B(2) Equipment

Each scale must be long enough to fit an entire vehicle or a combination vehicle on the scale deck. The Department allows you to weigh a combination vehicle separately if you disconnect the vehicles.

Construct scale undersupports:

1. Using portland cement concrete containing at least 470 pounds of cement per cubic yard produced from commercial quality materials
2. Such that footing heights are at least 20 inches thick
3. With a bearing surface at least 30 inches wide and bearing pressure on the footing not over 4000 lb/sq ft

In constructing a scale:

1. Furnish drainage to prevent water from saturating the ground under the scale
2. Use bulkheads that prevent displacement
3. If shimming is necessary:
   3.1. Use securely attached metal shims or grout
   3.2. Do not use wedges to shim the supports
   3.3. Do not use shim material in excess of 3 inches
4. Install mechanical indicating elements level, plumb, and rigidly mounted on the concrete undersupports
5. For a hopper scale, rigidly attach hopper scale lever systems and mechanical indicating elements so no weight is lost from bending or support distortion

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Each scale used to determine material payment quantities must be operated by a licensed weighmaster (Bus & Prof Code § 12700 et seq.).

Submit a public weighmaster's certificate or certified daily summary weigh sheets for each weighed material quantity. The Department may witness material weighing and check and compile the daily scale weight record.

Each vehicle operator must obtain weight or load slips from the weighmaster. Submit these records at the delivery point.

9-1.02B(3) Procedures

Weigh empty vehicles used to haul material paid for by weight daily. Each vehicle must have a legible identification mark. The Department may verify material weight by having an empty and loaded vehicle weighed on any scale the Engineer designates.

If imported topsoil, soil amendment, or mulch is measured by volume:

1. Each vehicle must allow for an accurate contents determination
2. Unless vehicles are of uniform capacity, each vehicle must have a legible identification mark showing its volume capacity
3. Load vehicles to at least the volume capacity
4. Level vehicle loads on arrival at the delivery point

If determining a quantity paid on a volume basis is impractical or if you request and the request is authorized, weigh the material and the Engineer converts the result to a volume measurement. The Engineer determines the conversion factors and, if you agree, adopts this method of measurement.

9-1.02C Final Pay Item Quantities

The Department shows a bid item quantity as a final pay item for payment purposes only. For a final pay item, accept payment based on the Bid Item List quantity, regardless of actual quantity used unless dimensions are changed by the Engineer.

9-1.02D Quantities of Aggregate and Other Roadway Materials

The Engineer determines the weight of aggregate and other roadway material that are being paid for by weight as shown in the following table and does not include the deducted weight of water in their payment quantities:

Determination of Quantities of Aggregate and Other Roadway Materials

Material	Quantity determination
Aggregate or other roadway material except as otherwise shown in this table	By deducting the weight of water in the material[a] in excess of 3 percent of the dry weight of the material from the weight of the material
Imported borrow, imported topsoil, aggregate subbase	By deducting the weight of water in the material[a] in excess of 6 percent of the dry weight of the material from the weight of the material
Straw	By deducting the weight of water in the material[a] in excess of 15 percent of the dry weight of the material from the weight of the material
Fiber[b]	Engineer does not deduct the weight of water
Aggregate base and aggregate for cement treated bases	As specified in section 26 and section 27

NOTE: Percentage of water is determined by California Test 226.
[a]At the time of weighing
[b]Weight of water in the fiber[a] must not exceed 15 percent of the dry weight of the fiber.

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9-1.03 PAYMENT SCOPE

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

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

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

Payment is:

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

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

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

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

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

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

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

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

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

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

The Department pays 10 percent annual interest for unpaid and undisputed:

1. Progress payments
2. After-acceptance payment except for claims

For these payments, interest starts to accrue 30 days after the 1st working day following the 20th day of the month payment is due. For a change order bill not submitted within 7 days after performing the work, interest starts to accrue 60 days after the 1st working day following the 20th day of the month payment is due.

The Department pays 6 percent annual interest for unpaid and undisputed claims. Interest starts to accrue 61 days after the Department accepts a claim statement.

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The Department pays 6 percent annual interest for awards in arbitration (Civ Code § 3289).

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

Pay your subcontractors within 7 days of receipt of each progress payment under Pub Cont Code §§ 10262 and 10262.5.

9-1.04 FORCE ACCOUNT

9-1.04A General

For work paid by force account, the Engineer compares the Department's records to your daily force account work report. When you and the Engineer agree on the contents of the daily force account work reports, the Engineer accepts the report and the Department pays for the work. If the records differ, the Department pays for the work based only on the information shown on the Department's records.

If a subcontractor performs work at force account, accept an additional 10 percent markup to the total cost of that work paid at force account, including markups specified in section 9-1.04, as reimbursement for additional administrative costs.

The markups specified for labor, materials, and equipment include compensation for all delay costs, overhead costs, and profit.

If an item's unit price is adjusted for work-character changes, the Department excludes your cost of determining the adjustment.

Payment for owner-operated labor and equipment is made at the market-priced invoice submitted.

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

9-1.04B Labor

Labor payment is full compensation for the cost of labor used in the direct performance of the work plus a 35 percent markup. Force account labor payment consists of:

1. Employer payment to the worker for:
   1.1. Basic hourly wage
   1.2. Health and welfare
   1.3. Pension
   1.4. Vacation
   1.5. Training
   1.6. Other State and federal recognized fringe benefit payments
2. Labor surcharge percentage in *Labor Surcharge and Equipment Rental Rates* current during the work paid at force account for:
   2.1. Workers' compensation insurance
   2.2. Social security
   2.3. Medicare
   2.4. Federal unemployment insurance
   2.5. State unemployment insurance
   2.6. State training taxes
3. Subsistence and travel allowances paid to the workers
4. Employer payment to supervisors, if authorized

The 35 percent markup consists of payment for all overhead costs related to labor but not designated as costs of labor used in the direct performance of the work including:

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1. Home office overhead
2. Field office overhead
3. Bond costs
4. Profit
5. Labor liability insurance
6. Other fixed or administrative costs that are not costs of labor used in the direct performance of the work

9-1.04C Materials

Material payment is full compensation for materials you furnish and use in the work. The Engineer determines the cost based on the material purchase price, including delivery charges, except:

1. A 15 percent markup is added
2. Supplier discounts are subtracted whether you took them or not
3. If the Engineer believes the material purchase prices are excessive, the Department pays the lowest current wholesale price for a similar material quantity
4. If you procured the materials from a source you wholly or partially own, the determined cost is based on the lower of the:
   4.1. Price paid by the purchaser for similar materials from that source on Contract items
   4.2. Current wholesale price for those materials
5. If you do not submit a material cost record within 30 days of billing, the determined cost is based on the lowest wholesale price:
   5.1. During that period
   5.2. In the quantities used

9-1.04D Equipment Rental

9-1.04D(1) General

Equipment rental payment is full compensation for:

1. Rental equipment costs, including moving rental equipment to and from the change order work site using its own power.
2. Transport equipment costs for rental equipment that cannot be transported economically using its own power. No payment is made during transport for the transported equipment.
3. 15 percent markup.

If you want to return the equipment to a location other than its original location, the payment to move the equipment must not exceed the cost of returning the equipment to its original location. If you use the equipment for work other than work paid by force account, the transportation cost is included in the other work.

Before moving or loading the equipment, obtain authorization for the equipment rental's original location.

The Engineer determines rental costs:

1. Using rates in *Labor Surcharge and Equipment Rental Rates*:
   1.1. By classifying equipment using manufacturer's ratings and manufacturer-approved changes.
   1.2. Current during the work paid by force account.
   1.3. Regardless of equipment ownership; but the Department uses the rental document rates or minimum rental cost terms if:
      1.3.1. Rented from equipment business you do not own.
      1.3.2. The Labor Surcharge and Equipment Rental Rates hourly rate is $10.00 per hour or less.
2. Using rates established by the Engineer for equipment not listed in *Labor Surcharge and Equipment Rental Rates*. You may submit cost information that helps the Engineer establish the rental rate; but the Department uses the rental document rates or minimum rental cost terms if:
   2.1. Rented from equipment business you do not own.
   2.2. The Engineer establishes a rate of $10.00 per hour or less.
3. Using rates for transport equipment not exceeding the hourly rates charged by established haulers.

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Equipment rental rates include the cost of:

1. Fuel
2. Oil
3. Lubrication
4. Supplies
5. Small tools that are not consumed by use
6. Necessary attachments
7. Repairs and maintenance
8. Depreciation
9. Storage
10. Insurance
11. Incidentals

The Department pays for small tools consumed by use. The Engineer determines payment for small tools consumed by use based on Contractor-submitted invoices.

The Engineer may authorize rates in excess of those in the *Labor Surcharge and Equipment Rental Rates* if:

1. You submit a request to use rented equipment
2. Equipment is not available from your normal sources or from one of your subcontractors
3. Rented equipment is from an independent rental company
4. Proposed equipment rental rate is reasonable
5. The Engineer authorizes the equipment source and the rental rate before you use the equipment

The Department pays for fuel consumed during the operation of rented equipment not included in the invoiced rental rates.

9-1.04D(2) Equipment On the Job Site

For equipment on the job site at the time required to perform work paid by force account, the time paid is the time:

1. To move the equipment to the location of work paid by force account plus an equal amount of time to move the equipment to another location on the job site when the work paid by force account is completed
2. To load and unload equipment
3. Equipment is operated to perform work paid by force account and:
   3.1. Hourly rates are paid in 1/2-hour increments
   3.2. Daily rates are paid in 1/2-day increments

9-1.04D(3) Equipment Not On the Job Site and Not Required for Original Contract Work

For equipment not on the job site at the time required to perform work paid by force account and not required for original Contract work, the time paid is the time the equipment is operated to perform work paid by force account and the time to return the equipment to its source when the work paid by force account is completed.

The minimum total time paid is:

1. 1 day if daily rates are paid
2. 8 hours if hourly rates are paid

If daily rates are recorded, equipment:

1. Idled is paid as 1/2 day
2. Operated less than 4 hours is paid as 1/2 day
3. Operated 4 hours or more is paid as 1 day

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If the minimum total time exceeds 8 hours and if hourly rates are listed, the Department rounds up hours operated to the nearest 1/2-hour increment and pays based on the hours shown the following table. The table does not apply when equipment is not operated due to breakdowns, in which case rental hours are the hours the equipment was operated.

Equipment Rental Hours

Hours operated	Hours paid
0.0	4.00
0.5	4.25
1.0	4.50
1.5	4.75
2.0	5.00
2.5	5.25
3.0	5.50
3.5	5.75
4.0	6.00
4.5	6.25
5.0	6.50
5.5	6.75
6.0	7.00
6.5	7.25
7.0	7.5
7.5	7.75
≥8.0	hours used

9-1.04D(4) Equipment Not On the Job Site Not Required for Original-Contract Work

9-1.04D(4) Equipment Not On the Job Site and Required for Original Contract Work

For equipment not on the job site at the time required to perform work paid by force account and required for original Contract work, the time paid is the time:

1. To move the equipment to the location of work paid by force account plus an equal amount of time to move the equipment to a location on the job site or its source when the work paid by force account is completed
2. Equipment is operated to perform work paid by force account

9-1.04D(5) Non-Owner-Operated Dump Truck Rental

Submit the rental rate for non-owner-operated dump truck rental. The Engineer determines the payment rate. Payment for non-owner-operated dump truck rental is for the cost of renting a dump truck, including its driver. For the purpose of markup payment only, the non-owner-operated dump truck is rental equipment and the owner is a subcontractor.

9-1.05 EXTRA WORK PERFORMED BY SPECIALISTS

If the Engineer determines that you or your subcontractors are not capable of performing specialty extra work, a specialist may be used. Itemize the labor, material, and equipment rental costs unless it is not the special service industry's established practice to provide itemization, in which case, the Engineer accepts current market-priced invoices for the work.

The Engineer may accept an invoice as a specialist billing for work performed at an off–job site manufacturing plant or machine shop.

The Engineer determines the cost based on the specialist invoice price minus any available or offered discounts plus a 10 percent markup.

9-1.06 CHANGED QUANTITY PAYMENT ADJUSTMENTS

9-1.06A General

The unit prices specified in section 9-1.06 are adjusted under section 9-1.04.

NOT FOR CONSTRUCTION

9-1.06B Increases of More Than 25 Percent

If the total bid item quantity exceeds 125 percent of the quantity shown on the Bid Item List and if no approved *Change Order* addresses payment for the quantity exceeding 125 percent, the Engineer may adjust the unit price for the excess quantity under section 9-1.04 or the following:

1. The adjustment is the difference between the unit price and the unit cost of the total item pay quantity.
2. In determining the unit cost, the Engineer excludes the item's fixed costs. You have recovered the fixed costs in the payment for 125 percent shown on the Bid Item List.
3. After excluding fixed costs, the Engineer determines the item unit cost under section 9-1.04.

If the payment for the number of units of a bid item in excess of 125 percent of the Bid Item List is less than $5,000 at the unit price, the Engineer may not adjust the unit price unless you request it.

9-1.06C Decreases of More Than 25 Percent

If the total item pay quantity is less than 75 percent of the quantity shown on the Bid Item List and if no approved *Change Order* addresses payment for the quantity less than 75 percent, you may request a unit price adjustment. The Engineer may adjust the unit price for the decreased quantity under section 9-1.04 or the following:

1. The adjustment is the difference between the unit price and the unit cost of the total pay quantity.
2. In determining the unit cost, the Engineer includes the item's fixed costs.
3. After including fixed costs, the Engineer determines the item unit cost under section 9-1.04.

The Department does not pay more than 75 percent of the item total in the Bid Item List.

9-1.06D Eliminated Items

If the Engineer eliminates an item, the Department pays your costs incurred before the Engineer's elimination notification date.

If you order authorized material for an eliminated item before the notification date and the order cannot be canceled, either of the following occurs:

1. If the material is returnable to the vendor, the Engineer orders you to return the material and the Department pays your handling costs and vendor charges.
2. The Department pays your cost for the material and its handling and becomes the material owner.

The Engineer determines the payment for the eliminated bid item under section 9-1.04.

9-1.07 PAYMENT ADJUSTMENTS FOR PRICE INDEX FLUCTUATIONS

9-1.07A General

Section 9-1.07 applies to asphalt contained in materials for pavement structure and pavement surface treatments such as HMA, tack coat, asphaltic emulsions, bituminous seals, asphalt binders, and modified asphalt binders placed in the work. Section 9-1.07 does not apply if you opted out of payment adjustments for price index fluctuations at the time of bid.

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

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

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

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

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

NOT FOR CONSTRUCTION

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

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

If the price index at the time of placement increases:

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

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

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

9-1.07B Asphalt Quantities

9-1.07B(1) General

Reserved

9-1.07B(2) Hot Mix Asphalt

The Engineer calculates the quantity of asphalt in HMA using the following formula:

$Qh = HMATT \times Xa$

where:
Qh = quantity in tons of asphalt used in HMA
HMATT = HMA, total tons placed
Xa = theoretical asphalt content from the job mix formula expressed as a percentage of the total weight of HMA

9-1.07B(3) Rubberized Hot Mix Asphalt

The Engineer calculates the quantity of asphalt in RHMA using the following formula:

$Qrh = RHMATT \times 0.80 \times Xarb$

where:
Qrh = quantity in tons of asphalt in asphalt rubber binder used in RHMA
RHMATT = RHMA, total tons placed
Xarb = theoretical asphalt rubber binder content from the job mix formula expressed as a percentage of the total weight of rubberized HMA

9-1.07B(4) Hot Mix Asphalt with Modified Asphalt Binder

The Engineer calculates the quantity of asphalt in HMA with modified asphalt binder using the following formula:

$Qmh = MHMATT \times [(100 - Xam) / 100] \times Xmab$

where:
Qmh = quantity in tons of asphalt in modified asphalt binder used in HMA
MHMATT = modified asphalt binder HMA, total tons placed
Xam = specified percentage of asphalt modifier

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Xmab = theoretical modified asphalt binder content from the job mix formula expressed as a percentage of the total weight of HMA

9-1.07B(5) Hot Mix Asphalt Containing Reclaimed Asphalt Pavement

The Engineer calculates the quantity of asphalt in HMA containing RAP using the following formula:

Qrap = *HMATT* x *Xaa*

where:
Xaa = *Xta* - [(100 - *Xnew*) x (*Xra* / 100)]

and:
Qrap = quantity in tons of asphalt used in HMA containing RAP
HMATT = HMA, total tons placed
Xaa = asphalt content of HMA adjusted to account for the asphalt content in RAP expressed as a percentage of the total weight of HMA
Xta = total asphalt content of HMA expressed as a percentage of the total weight of HMA
Xnew = theoretical percentage of new aggregate in the HMA containing RAP determined from the RAP percentage in the job mix formula
Xra = asphalt content of RAP expressed as percentage

9-1.07B(6) Tack Coat

The Engineer calculates the quantity of asphalt in tack coat (Qtc) as either of the following:

1. Asphalt binder using the asphalt binder total tons placed as tack coat
2. Asphaltic emulsion by applying the formula in section 9-1.07B(7) to the asphaltic emulsion total tons placed as tack coat

9-1.07B(7) Asphaltic Emulsion

The Engineer calculates the quantity of asphalt in asphaltic emulsions, including fog seals and tack coat, using the following formula:

Qe = *AETT* x (*Xe* / 100)

where:
Qe = quantity in tons of asphalt used in asphaltic emulsions
AETT = undiluted asphaltic emulsions, total tons placed
Xe = minimum percent residue specified in section 94 based on the type of emulsion used

You may determine *Xe* by submitting daily test results for asphalt residue for the asphaltic emulsion used. If you choose this option, you must:

1. Take 1 sample for every 200 tons but not less than 1 sample per day in the presence of the Engineer from the delivery truck, at midload from a sampling tap or thief, and as follows:
   1.1. Draw and discard the 1st gallon
   1.2. Take 2 separate 1/2 gal samples
2. Submit the 1st sample at the time of sampling
3. Furnish the 2nd sample within 3 business days of sampling to an authorized laboratory that participates in the AASHTO Proficiency Sample Program
4. Submit test results from the laboratory within 10 business days of sample date

9-1.07B(8) Slurry Seal

The Engineer calculates the quantity of asphalt in slurry seals (Qss) by applying the formula in section 9-1.07B(7) to the quantity of asphaltic emulsion used in producing the slurry seal mix.

9-1.07B(9) Modified Asphalt Binder

The Engineer calculates the quantity of asphalt in modified asphalt binder using the following formula:

NOT FOR CONSTRUCTION

Qmab = *MABTT* x [(100 - *Xam*) / 100]

where:
Qmab = quantity in tons of asphalt used in modified asphalt binder
MABTT = modified asphalt binder, total tons placed
Xam = specified percentage of asphalt modifier

The quantity of extender oil is included in the quantity of asphalt.

9-1.07B(10) Other Materials

For materials containing asphalt not covered in sections 9-1.07B(1) through 9-1.07B(9), the Engineer determines the method for calculating the quantity of asphalt (*Qo*).

9-1.07C Payment Adjustments

The Engineer includes payment adjustments for price index fluctuations in progress estimates. If material containing asphalt is placed within 2 months during 1 estimate period, the Engineer calculates 2 separate adjustments. Each adjustment is calculated using the price index for the month in which the quantity of material containing asphalt subject to adjustment is placed in the work. The sum of the 2 adjustments is used for increasing or decreasing payment in the progress estimate.

The Engineer calculates each payment adjustment using the following formula:

PA = *Qt* x *A*

where:
PA = Payment adjustment in dollars for asphalt contained in materials placed in the work for a given month
Qt = Sum of all quantities of asphalt (*Qh* + *Qrh* + *Qmh* + *Qrap* + *Qtc* + *Qe* + *Qss* + *Qmab* + *Qo*)
A = Adjustment in dollars per ton of asphalt used to produce materials placed in the work rounded to the nearest $0.01

where:
A = [(*Iu* / *Ib*) - 1.05] x *Ib* x [1 + (*T* / 100)] for an increase in the crude oil price index exceeding 5 percent
A = [(Iu / Ib) - 0.95] x Ib x [1 + (T / 100)] for a decrease in the crude oil price index exceeding 5 percent

and:

Iu = California statewide crude oil price index for the month in which the quantity of asphalt subject to adjustment was placed in the work
Ib = California statewide crude oil price index for the month in which the bid opening for the project occurred
T = Sales and use tax rate expressed as a percent currently in effect in the tax jurisdiction where the material is placed. If the tax rate information is not submitted timely, the statewide sales and use tax rate is used in the payment adjustment calculations until the tax rate information is submitted.

9-1.08–9-1.10 RESERVED

9-1.11 TIME-RELATED OVERHEAD

Not Used

9-1.12–9-1.14 RESERVED

9-1.15 WORK-CHARACTER CHANGES

The Department adjusts a bid item unit price based on the difference between the cost to perform the work as planned and the cost to perform the work as changed. The Engineer determines the payment adjustment under section 9-1.04. The Department adjusts payment for only the work portion that changed in character.

NOT FOR CONSTRUCTION

9-1.16 PROGRESS PAYMENTS

9-1.16A General

The Department pays you based on Engineer-prepared monthly progress estimates. Each estimate reflects:

1. Total work completed during the pay period
2. Change order bills if:
   2.1. Submitted by the 15th day of a month
   2.2. Approved by the 20th day of a month
3. Amount for materials on hand
4. Amount earned for mobilization
5. Deductions
6. Withholds
7. Resolved potential claims
8. Payment adjustments

Submit certification stating the work complies with the QC procedures. The Engineer does not process a progress estimate without a signed certification.

9-1.16B Schedule of Values

Section 9-1.16B applies to a lump sum bid item for which a schedule of values is specified to be submitted.

The sum of the amounts for the work units listed in the schedule of values must equal the lump sum price bid for the bid item.

Obtain authorization of a schedule of values before you perform work shown on the schedule. The Department does not process a progress payment for the bid item without an authorized schedule of values.

Accept progress payments for overhead, profit, bond costs, and other fixed or administrative costs as distributed proportionally among the items listed except that for a contract with a bid item for mobilization, accept progress payments for bond costs as included in the mobilization bid item.

For changed quantities of the work units listed, the Department adjusts payments in the same manner as specified for changed quantities of bid items under section 9-1.06.

9-1.16C Materials On Hand

A material on hand but not incorporated into the work is eligible for progress payment if:

1. Listed in a special provision as eligible and is in compliance with other Contract parts
2. Purchased
3. An invoice is submitted
4. Stored within the State and you submit evidence that the stored material is subject to the Department's control
5. Requested on the Department-furnished form

9-1.16D Mobilization

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.

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).

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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.

9-1.16E Withholds

9-1.16E(1) General

The Department may withhold payment for noncompliance.

The Department returns the noncompliance withhold in the progress payment following correction of noncompliance.

Withholds are not retentions under Pub Cont Code § 7107 and do not accrue interest under Pub Cont Code § 10261.5.

Withholds are cumulative and independent of deductions.

Section 9-1.16E does not include all withholds that may be taken; the Department may withhold other payments as specified.

9-1.16E(2) Progress Withholds

The Department withholds 10 percent of a progress payment for noncompliant progress. Noncompliant progress occurs when:

1. Total days to date exceed 75 percent of the working days
2. Percent of working days elapsed exceeds the percent of value of work completed by more than 15 percent

The Engineer determines the percent of working days elapsed by dividing the total days to date by the revised Contract working days and converting the quotient to a percentage.

The Engineer determines the percent of value of work completed by summing payments made to date and the amount due on the current progress estimate, dividing this sum by the current total estimated value of the work, and converting the quotient to a percentage. These amounts are shown on the *Progress Payment Voucher*.

When the percent of working days elapsed minus the percent of value of work completed is less than or equal to 15 percent, the Department returns the withhold in the next progress payment.

9-1.16E(3) Performance Failure Withholds

During each estimate period you fail to comply with a Contract part, including submittal of a document as specified, the Department withholds a part of the progress payment. The documents include QC plans, schedules, traffic control plans, and water pollution control submittals.

For 1 performance failure, the Department withholds 25 percent of the progress payment but does not withhold more than 10 percent of the total bid.

For multiple performance failures, the Department withholds 100 percent of the progress payment but does not withhold more than 10 percent of the total bid.

The City returns performance-failure withholds in the progress payment following the correction of noncompliance.

9-1.16E(4) Stop Notice Withholds

The Department may withhold payments to cover claims filed under Civ Code § 3179 et seq.

9-1.16E(5) Penalty Withholds

Penalties include fines and damages that are proposed, assessed, or levied against you or the Department by a governmental agency or private lawsuit. Penalties are also payments made or costs incurred in settling alleged violations of federal, state, or local laws, regulations, requirements, or PLACs. The cost incurred may include the amount spent for mitigation or correcting a violation.

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If the Department is assessed a penalty, the Department may withhold the penalty amount until the penalty disposition has been resolved. The Department may withhold penalty amounts without notifying you.

Instead of the withhold, you may provide a bond equal to the highest estimated liability for any disputed penalties proposed except you may not provide a bond for withholds related to labor compliance violations.

9-1.16E(6)–9-1.16E(10) Reserved

9-1.16F Retentions

The City will withhold 5 percent of all progress payments as retention. Retention will be paid to you on the Final Payment.

You will have the right to substitute securities for the retention under Pub Cont Code § 22300. No substitution will be accepted until:

1. the City approves the securities and their value,
2. the parties have entered into an escrow agreement (if the securities are to be held in escrow) in a form substantially similar to that under § 22300,
3. all documentation necessary for assignment of the securities to the City or to the escrow agent, are delivered in a form satisfactory to the City.

If you have substituted securities for any of the retention, the City may request that such securities be revalued from time to time, but not more often than monthly. Such revaluation will be made by a person or entity designated by the City and approved by you. If such revaluation results in a determination that the securities have a market value less than the amount of retention for which they were substituted, then the amount of the retention required under the Contract will be increased by such difference in market value. Such increased retention will be withheld from the next progress payment(s) due to you under the Contract.

The agency shall hold retainage from the prime contractor and shall make prompt and regular incremental acceptances of portions, as determined by the agency, of the contract work, and pay retainage to the prime contractor based on these acceptances. The prime contractor, or subcontractor, shall return all monies withheld in retention from a subcontractor within 30 days after receiving payment for work satisfactorily completed and accepted including incremental acceptances of portions of the contract work by the agency. Federal law (49CFR26.29) requires that any delay or postponement of payment over 30 days may take place only for good cause and with the agency's prior written approval. Any violation of this provision shall subject the violating prime contractor or subcontractor to the penalties, sanctions and other remedies specified in Section 7108.5 of the Business and Professions Code. These requirements 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, deficient subcontract performance, or noncompliance by a subcontractor.

9-1.16G–9-1.16M Reserved

9-1.17 PAYMENT AFTER CONTRACT ACCEPTANCE

9-1.17A General

Reserved

9-1.17B Payment Before Final Estimate

After Contract acceptance, the Department pays you based on the Engineer-prepared estimate that includes withholds and the balance due after deduction of previous payments.

9-1.17C Proposed Final Estimate

The Engineer estimates the amount of work completed and shows the amount payable in a proposed final estimate based on:

1. Contract items

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2. Payment adjustments
3. Work paid by force account or agreed price
4. Extra work
5. Deductions

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.

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. The adjustment is 10 percent of the difference between the total bid and the final estimate. The Department does not make this adjustment on a terminated contract.

9-1.17D Final Payment and Claims

9-1.17D(1) General

If you accept the proposed final estimate or do not submit a claim statement within 30 days of receiving the estimate, the Engineer furnishes the final estimate to you and the Department pays the amount due within 30 days. This final estimate and payment is conclusive except as specified in sections 5-1.27, 6-3.06, and 9-1.21.

If you submit a claim statement within 30 days of receiving the Engineer's proposed final estimate, the Engineer furnishes a semifinal estimate to the Contractor and the Department pays the amount due within 30 days. The semifinal estimate is conclusive as to the amount of work completed and the amount payable except as affected by the claims or as specified in sections 5-1.27, 6-3.06, and 9-1.21.

9-1.17D(2) Claim Statement

9-1.17D(2)(a) General

For each claim, submit a claim statement showing only the identification number that corresponds to the *Full and Final Potential Claim Record* and the final amount of additional payment requested except:

1. If the final amount of requested payment differs from the amount requested in the *Full and Final Potential Claim Record*
2. For a claim for quantities, withholds, deductions, liquidated damages, or change order bills
3. For an overhead claim

If the final amount of requested payment differs from the amount requested in the *Full and Final Potential Claim Record*, submit:

1. Identification number that corresponds to the *Full and Final Potential Claim Record*
2. Final amount of additional payment requested
3. Basis for the changed amount
4. Contract documentation that supports the changed amount
5. Statement of the reasons the Contract documentation supports the claim

The Engineer notifies you of an omission of or a disparity in the exclusive identification number. Within 15 days of the notification, correct the omission or disparity. If the omission or disparity is not resolved after the 15 days, the Engineer assigns a new number.

For a claim for quantities, withholds, deductions, or change order bills submit:

1. Final amount of additional payment requested
2. Enough detail to enable the Engineer to determine the basis and amounts of the additional payment requested

9-1.17D(2)(b) Overhead Claims

Include with an overhead claim:

1. Final amount of additional payment requested

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2. Independent CPA audit report

Failure to submit the audit report with an overhead claim with the claim statement is a waiver of the overhead claim and operates as a bar to arbitration on the claim (Pub Cont Code § 10240.2).

The Department deducts an amount for field and home office overhead paid on added work from any claim for overhead. The value of the added work equals the value of the work completed minus the total bid. The home office overhead deduction equals 5 percent of the added work. The field office overhead deduction equals 5-1/2 percent of the added work.

If you intend to pursue a claim for reimbursement for field or home office overhead beyond that provided expressly by the Contract:

1. Notify the Engineer within 30 days of receipt of the proposed final estimate of your intent to seek reimbursement for specific overhead costs beyond that provided by the Contract
2. Specifically identify each claim and each date associated with each claim from which you seek reimbursement for specific overhead costs beyond that provided by the Contract
3. Timely submit all other claims
4. Within 30 days of receipt of the proposed final estimate, submit an audit report prepared by an independent CPA
    4.1. The audit report must show calculations with supporting documentation of actual home office and project field overhead costs
    4.2. The calculations must specify the actual daily rates for both field and home office overhead for the entire duration of the project expressed as a rate per working day
    4.3. The start and end dates of the actual project performance period, number of working days, overhead cost pools, and all allocation bases must be disclosed in the calculations of your actual field and home office overhead daily rates
    4.4. Neither daily rate may include a markup for profit
5. Field overhead costs from which the daily rate is calculated must be:
    5.1. Allowable under 48 CFR 31
    5.2. Supported by reliable records
    5.3. Related solely to the project
    5.4. Incurred during the actual project performance period
    5.5. Comprised of only time-related field overhead costs
    5.6. Not a direct cost
6. Home office overhead costs from which the daily rate is calculated must be:
    6.1. Allowable under 48 CFR 31
    6.2. Supported by reliable records
    6.3. Incurred during the actual project performance period
    6.4. Comprised of only fixed home office overhead costs
    6.5. Not a direct cost

The actual rate of time-related overhead is subject to authorization by the Engineer.

The CPA's audit must be performed under the Attestation Standards published by the American Institute of Certified Public Accountants. The CPA's audit report must express an opinion whether or not your calculations of your actual field and home office overhead daily rates comply with section 9-1.17D(2)(b). The attest documentation prepared by the CPA in connection with the audit must be reproduced and submitted for review with the audit report.

The Department provides markups for all work paid by force account. Overhead for field and home office costs are included in the markups. Overhead claims in excess of Contract markups are not allowed under the Contract. If you seek reimbursement for costs not allowed under the Contract, the Department does not pay your cost of performing the independent CPA examination specified in section 9-1.17D(2)(b), including preparation of the audit report.

9-1.17D(2)(c) Declaration

Submit a declaration that includes the following language with the claim statement:

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I declare under penalty of perjury, according to the laws of the State of California, that the foregoing claims, with specific reference to the California False Claims Act (Govt Code § 12650 et seq.) and to the extent the project contains federal funding, the U.S. False Claims Act (31 USC § 3729 et seq.), are true and correct, and that this declaration was signed on _____(date)_____, 20__ at _____, California.

9-1.17D(2)(d) Waiver

A claim is waived if:

1. Claim does not have a corresponding *Full and Final Potential Claim Record* identification number
2. Claim does not have the same nature, circumstances, and basis of claim as the corresponding *Full and Final Potential Claim Record*
3. Claim is not included in the claim statement
4. You do not comply with the claim procedures
5. You do not submit the declaration specified in section 9-1.17D(2)(c)

9-1.17D(3) Final Determination of Claims

Failure to allow timely access to claim supporting data when requested waives the claim.

The Department's costs in reviewing or auditing a claim not supported by the Contractor's accounting or other records are damages incurred by the State within the meaning of the California False Claims Act.

If the Engineer determines that a claim requires additional analysis, the Engineer schedules a board of review meeting. Meet with the board of review and make a presentation supporting the claim.

After claim review completion by the Engineer or board of review, the Department makes the final determination of claims and furnishes it to the Contractor.

After the determination, the Engineer furnishes a final estimate to the Contractor and the Department pays the amount due within 30 days. The final estimate is conclusive as to the amount of work completed and the amount payable except as specified in sections 5-1.27, 6-3.06, and 9-1.21.

The Contractor's failure to comply with the claim procedures is a bar to arbitration under Pub Cont Code § 10240.2.

9-1.18–9-1.20 RESERVED

9-1.21 CLERICAL ERRORS

For 3 years after Contract acceptance, estimates and payments are open to correction and adjustment for clerical errors. Either the Department or the Contractor pays to the other the amount due except for clerical errors resulting in an adjustment less than $200, in which case, no payment is made.

9-1.22 ARBITRATION

Article 7 of the Draft Contract applies.

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TECHNICAL SPECIAL PROVISIONS

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DIVISION I GENERAL PROVISIONS

1 GENERAL

Add to section 1-1.01:

Bid Items and Applicable Sections

Item code	Item description	Applicable section
067000	TRANSPORTATION AND DISPOSING OF TYPE DC METAL MATERIAL	14
067003	TRANSPORTATION AND DISPOSING OF TYPE DC MATERIAL	14
070031	TRANSMISSION TOWER SURVEYS	19
780142	PIPE BRACKET	75
513571	MODULAR BLOCK WALL	47

Add to section 1-1.09:

This project is in a freeze-thaw area.

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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 *Information Handout*	Cross sections Foundation Report for Blair's Lane at Hangtown Bridge,(5/30/07) PG&E Utility Pole Stability Analysis Preliminary Site Investigation (2/25/15) Risk Management Plan for Soil and Groundwater (3/23/15) Site Safety and Health Plan (2/24/15) New and Revised Standard Plans
Available in Appendix A	Permits - ACOE 404, RWQCB 401 Water Quality Certification, Department of Fish and Wildlife 1602 Streambed Alteration Agreement,
Included with the project plans	Log of Test Borings

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5 CONTROL OF WORK

Replace section 5-1.26 with:

5-1.26 CONSTRUCTION SURVEYS

5-1.26A General

5-1.26A(1) Summary

Section 5-26 includes specifications for furnishing and setting construction stakes and markers to establish the lines and grades required for the completion of the work and as necessary for the Engineer to check lines, grades, alignment and elevations.

You must perform construction staking as necessary to control the work. Furnish and set construction stakes and marks with accuracy adequate to assure that the completed work conforms to the lines, grades, and section. Vertical alignment and the coordinates of centerlines and layout lines will be furnished to you at the pre-construction conference for use in performing the construction staking.

5-1.26A(2) Definitions

You must follow all procedures, methods, and typical stake markings under Chapter 12, Construction Surveys, of the Caltrans publication "Surveys Manual." Copies of the "Survey Manual" may be purchased from Caltrans Publications Unit 1900 Royal Oaks Drive, Sacramento, California 95815, (916) 445-3520.

5-1.26A(3) Submittals

You must submit all computations necessary to establish the exact position of the work from control points. All computations, survey notes, and other records necessary to accomplish the work must be neat, legible, and accurate. Copies of such computation, notes and other records must be furnished to the Engineer prior to beginning work that requires their use.

Upon completion of construction staking and prior to acceptance of the contract, all computations, survey notes, and other data used to accomplish the work must be submitted to the Engineer and will become the property of the County.

5-1.26A(4) Quality Control and Assurance

Not used.

5-1.26B MATERIALS

Not used.

5-1.26C CONSTRUCTION

Construction stakes and marks (including paint marks) must be removed from the site of work when no longer needed.

5-1.26D PAYMENT

The Department pays you for construction staking as follows:

1. A total of 90 percent of the item total over the life of the contract.
2. A total of 100 percent of the item total upon submission of final computations, notes and other data.

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Add to section 5-1.36D:

Installation of the utilities shown in the following table requires coordination with your activities. All utility relocations must be included in your CPM baseline schedule. 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	Days	Notification
AT&T	Astrid Willard AT&T Public Works Liaison 2700 Watt Ave. Room 3473-11 Sacramento, Ca 95821	Overhead relocations station 104+75 to 106+95.	2	3 weeks
AT&T	Astrid Willard AT&T Public Works Liaison 2700 Watt Ave. Room 3473-11 Sacramento, Ca 95821	Underground relocations station 106+80 to 108+50	2	3 weeks
Comcast	Steve Abelia 1242 National Drive Sacramento, Ca 95834	Underground relocations station 106+80 to 108+50	2	3 weeks
Comcast	Steve Abelia 1242 National Drive Sacramento, Ca 95834	Temporary relocation	2	3 weeks
PG&E	Jennifer Donovan PG&E Service Planning Department 4636 Missouri Flat Road Placerville, CA 95667	Underground relocation station 106+80 to 108+50	2 for temporary relocation 2 for permanent relocation	3 weeks

Notify the following utilities two weeks before excavating near the transmission tower (station 107+90 lt) and the utility poles and guy anchors (stations 104+75-105+25 rt, 106+40 lt, 106+90 lt, and 106+80 rt).

Utility	Utility address
PG&E	Jennifer Donovan PG&E Service Planning Department 4636 Missouri Flat Road Placerville, CA 95667

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7 LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC

Replace section 7-1.02K(6)(j)(iii) with:

7-1.02K(6)(j)(iii) Reserved

Replace section 7-1.02K(6)(j)(iv) with:

7-1.02K(6)(j)(iv) Earth Material Containing Hazardous Waste Concentrations Lead and/or CAM 17 Metals.

Section 7-1.02K(6)(j)(iv) includes specifications for hazardous waste management while excavating, stockpiling, transporting, placing, and disposing of material containing hazardous waste (concentrations of lead that is in excess of 1000 mg/kg or in excess of 5.0 mg/l). A Preliminary Site Assessment is included in the *Information Handout*. Additional metals (CAM 17 metals, defined in 14-11.06) may be

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present below the Blairs Lane Bridge over Hangtown Creek or within the excavation boundaries of the project on Blairs Lane and Broadway. Soils containing hazardous concentrations of lead and other CAM 17 metals are defined as Type DC Metal material in section 14-11.06A(2).

Lead concentrations that exceed DTSC thresholds for hazardous waste are present within the project limits below the bridge and within five (5) feet of either side of the bridge. Submit a lead compliance plan. The lead compliance plan must include materials and methods discussed in Section 7-1.02K(6)(j)(ii) and Section 14-11.08A.

Lead is present in earth material on the job site in soil below the bridge. The average lead concentration was above 5.0 mg/l soluble lead. The material on the job site:

1. Is a hazardous waste
2. Requires disposal at a permitted landfill or solid waste disposal facility

Lead has been detected in material to a depth of 2 feet below ground surface in soils below the bridge. Levels of lead found on the job site below the bridge were 110 mg/kg total lead as analyzed by EPA test method 6010 or EPA test method 7000 series. Levels of lead found below the bridge and to five (5) feet either upstream or downstream of the bridge contained a soluble concentration of 17 mg/L as analyzed by the California Waste Extraction Test.

Handle the material under all applicable laws, rules, and regulations, including those of the following agencies:

1. Cal/OSHA
2. CA RWQCB, Region 5 — Central Valley Regional Water Quality Control Board
3. CA Department of Toxic Substances Control
4. El Dorado County Environmental Health Department

Manage the material as shown in the following table.

Earth Material Management

Location	Depth	Management requirements
Below Blairs Lane Bridge (from 5' upstream to 5' downstream)	0.0 – 2.0 feet	Place into drums onsite or stockpile soil on top of plastic and cover to prevent fugitive dust pending soil analytical confirming metal concentrations as described in 14-11.06A(4)(d) and 14-11.06A(4)(e).
Below Blairs Lane Bridge(from 5' upstream to 5' downstream)	>2' below existing grade	Additional testing will be performed by the California registered professional to determine additional action.

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Excavation and Transportation Plan

Within 7 days after approval of the Contract, submit 3 copies of an excavation and transportation plan. Allow 7 days for review. If revisions are required, as determined by the Engineer, submit the revised plan within 3 days of receipt of the Engineer's comments. For the revision, allow 3 days for the review. Minor changes to or clarifications of the initial submittal may be made and attached as amendments to the excavation and transportation plan. In order to allow construction to proceed, the Engineer may conditionally approve the plan while minor revisions or amendments are being completed.

Prepare the written, project specific excavation and transportation plan establishing the procedures you will use to comply with requirements for excavating, stockpiling, transporting, and placing or disposing of Type DC metal material. The plan must comply with the regulations of the DTSC and Cal/OSHA. The sampling and analysis portions of the excavation and transportation plan must meet the requirements for the design and development of the sampling plan, statistical analysis, and reporting of test results

contained in US EPA, SW 846, "Test Methods for Evaluating Solid Waste," Volume II: Field Manual Physical/Chemical, Chapter Nine, Section 9.1. The plan must include the following elements:

1. Excavation schedule by location and date
2. Temporary locations of stockpiled material
3. Sampling and analysis shall be conducted by a California registered environmental professional as specified in Section 14-11.08. Include the following:
   - 3.1. Location of excavated materials and number of samples collected by the California registered environmental professional
   - 3.2. Name and address of the CDPH Environmental Laboratory Accreditation Program (ELAP) certified laboratory where the analysis was performed.
4. Sampling and analysis plan for soil cover
5. Sampling and analysis plan for post excavation as specified in Section 14.11-08B(5).
6. Dust control measures
7. Air monitoring. Include the following information:
   - 7.1. Location and type of equipment
   - 7.2. Sampling frequency
   - 7.3. Name and address of the accredited laboratory where the analysis was performed
8. Method for preventing spills and tracking material onto public roads
9. Truck waiting and staging areas
10. Transportation equipment and routes
11. Example of bill of lading to be carried by trucks transporting earth material containing lead. The bill of lading must include:
    - 11.1. US Department of Transportation (US DOT) description including shipping name
    - 11.2. Hazard class
    - 11.3. Identification number
    - 11.4. Handling codes
    - 11.5. Quantity of material
    - 11.6. Volume of material
12. Spill Contingency Plan for material containing lead.
13. Site for disposal of hazardous waste

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8 PROSECUTION AND PROGRESS

Replace the first paragraph in section 8-1.02C(5) with:

Submit a baseline schedule and all support data within 10 days of contract approval. Allow 5 days for the Engineer's review after the submittal.

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

Section 8-1.04B does not apply.

Start job site activities on the date specified in the Notice to Proceed.

The work, excluding plant establishment, shall be diligently prosecuted to completion before the expiration of 205 WORKING DAYS beginning on the date specified in the Notice to Proceed. Complete plant establishment work within 1 years, starting at the end of the working days.

The Contractor shall pay to the City of Placerville the sum of $ 3,000 per day, for each and every calendar day's delay in finishing the work in excess of the number of working days prescribed above.

NOT FOR CONSTRUCTION

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

1. Contractor-supplied biologist
2. CPM baseline schedule
3. SWPPP

If the submittals for Contractor-supplied biologist and biological resource information program are authorized, you may enter the job site only to measure controlling field dimensions and locate utilities.

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. Modular block wall
2. Bar Reinforcing Steel (Bridge)
3. Bar Reinforcing Steel (Retaining wall)
4. Bar Reinforcing Steel (Epoxy Coated) (Bridge)
5. 18", 30" and 36" Corrugated Steel Pipe and Appurtenances
6. 60" and 72" Precast Concrete Pipe Manholes
7. Miscellaneous Iron and Steel
8. 48" and 60" Sewer Manholes
9. Vinyl Clad Chain Link Fence (Type CI-3) and (Type CI-6)
10. 22' and 24' Chain Link Gates
11. Miscellaneous Metal (Bridge)
12. Barrier Mounted Iron Railing

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Traffic can be placed on unpaved surfaces with Engineer approval.

Notify the Caltrans Supervisor/Superintendent at the CT maintenance station 5 days before any bridge closure.

Construction and removal of fence and gates must be scheduled to maintain public access restrictions at all times.

Maintain access to driveways at all times. Do not limit delivery truck access. Coordinate construction of driveways with delivery trucks.

Maintain lighting, fencing, and security at the Caltrans Maintenance Station Gate at all times.

Paint over existing traffic stripe that conflicts with the traffic handling with black paint.

Replace "Reserved" in section 10-1.03 of the RSS for section 10-1 with:

You may work within Hangtown Creek only from April 15th to October 15th of any year.

You are responsible for maintaining adequate drainage throughout the construction project.

Maintain sewer and water service at all times. Maintain electric, phone and ccable services as required by owners at all times.

PG&E will construct and remove a temporary fence at the temporary construction easement to prevent access to the secure substation area (Sta 103+64 to 105+86 Lt). You must place temporary fence from Sta 105+86 to 107+07 Lt.

NOT FOR CONSTRUCTION

Replace "Reserved" in section 10-3 with:

10-3 TEMPORARY CREEK DIVERSION

10-3.01 GENERAL

10-3.01A Summary

Section 10-3 includes specifications for diverting and dewatering of Hangtown Creek through the work area as shown.

Creek diversion and dewatering must comply with the project Permits and specifications and allow for fish passage.

Water will be diverted using water pillows, rock, sandbags, sheet piling, temporary culvert or other structural methods approved by the Engineer.

The creek may have water when the diversion is placed and temporary diversion of water may be needed while constructing a stream diversion. The presence of water (or anticipated presence of water) before construction may not indicate conditions when the work is scheduled.

Hangtown creek may contain e coli & other contaminants from the sewer system in the creek. You must verify and protect your employees if present.

Comply with PLACs.

10-3.01B Submittals

Within 10 days after contract approval, submit 2 copies of the temporary creek diversion system and dewatering plan to the Engineer. Allow 5 days for the Engineer's review. If revisions are required, the Engineer will provide comments and specify the date that the review stopped. You must revise and resubmit the temporary creek diversion system and dewatering plan within 5 days of receipt of the Engineer's comments. The Engineer's review will resume when the complete the temporary creek diversion system and dewatering plan is resubmitted. Allow 3 days for review of resubmittals. When the Engineer approves the temporary creek diversion system and dewatering plan, submit 2 copies of the approved plan to the Engineer.

No work will be performed that may cause creek flow disturbance until the plan has been approved.

You may proceed with construction activities if the Engineer conditionally approves the temporary creek diversion system and dewatering plan while minor revisions are being completed.

10-3.02 MATERIALS

Not used.

10-3.03 CONSTRUCTION

Do not construct the creek diversion prior to May 15 of any year. Remove the creek diversion before October 15. Work outside these windows may be allowed with concurrence by the Calfornia Department of Fish and Wildlife and the Engineer.

The temporary creek diversion system shall be capable of passing a minimum of 40 cfs continuous flow throughout the construction period.

Repair and replace any portion of the temporary creek diversion system that is damaged during the progress at your own expense.

Prevent any leakage in the temporary creek diversion system that may interfere with your work at your own expense.

You must inspect and clean temporary creek diversion system a minimum of two times per week for the duration of the project.

Remove the temporary creek diversion system when no longer required for the work. All materials shall be removed such that the original flow line of the channel is not raised and channel opening complies with the Contour Grading Plan.

10-3.04 PAYMENT

Payment for the diversion and dewatering plan, temporary creek diversion system and dewatering is included in the payment for the various bid items.

^^

12 TEMPORARY TRAFFIC CONTROL

Replace section 12-3.05 with:

12-3.05 PORTABLE FLASHING BEACONS

12-3.05A General

Section 12-3.05 includes specifications for installing, removing, and moving portable flashing beacons.

Each portable flashing beacon must have:

1. Standard and base
2. Lighting unit
3. Flasher unit
4. Battery power source

Assemble units to form a complete, self-contained, flashing beacon that can be delivered to the job site and placed into immediate operation.

12-3.05B Materials

The lens for the beacon lighting unit must have a visible diameter of 12 inches. The lens must be glass or plastic as specified in ANSI D-10.1 for a yellow traffic signal lens.

NOT FOR CONSTRUCTION

Provide a minimum 8-inch-long visor and a backplate for the beacon lighting unit. Visors are not required during the hours of darkness.

The flasher unit must provide 50 to 60 flashes per minute with 250- to 350-milliseconds dwell time.

The standard must be adjustable to provide variable mounting of the lighting unit from 6 to 10 feet, measured from the bottom of the base to the center of the lens, with provisions for securing the standard at the desired height. Securely attach the standard to the base and provide enough length of multi-conductor, neoprene jacketed cable as required for the full vertical height.

The base must be large enough to accommodate a minimum of two 12-V automotive-type storage batteries, and must be of such shape and mass that the beacon will not roll in the event it is struck by a vehicle or pushed over.

The lamp must be rated at 25 W for operation on 12-V battery current.

The flashing beacon assembly must be weatherproof and must be capable of operating a minimum of 150 hours between battery recharging or other routine maintenance.

The standard and base must be finished with 2 applications of commercial-quality, orange enamel similar in color to color no. 12473 of Federal Standard 595B. The interior of the visor and the front face of the backplate must be finished with 2 applications of commercial-quality flat black enamel.

12-3.05C Construction

Remove portable flashing beacon from the traveled way at the end of each night's work. You may store the flashing beacon at selected central locations within the highway where designated by the Engineer.

Immediately repair and repaint, or replace flashing beacons in their original locations when they are displaced or not in an upright position from any cause.

The Department does not pay for repair or replacement of portable flashing beacons.

12-3.05D Payment

Portable flashing beacons are measured once at each location.

NOT FOR CONSTRUCTION

Add section 12-3.18 to section 12-3:

12-3.18 ALTERNATIVE TEMPORARY CRASH CUSHION MODULE

12-3.18A General

Section 12-3.18 includes specifications for installing and maintaining alternative temporary crash cushions.

The alternative temporary crash cushion must be in place before opening traffic lanes adjacent to the obstacle.

12-3.18B Materials

An alternative temporary crash cushion must:

1. Be on the Authorized Material List for highway safety features
2. Approved for design speeds at or below 30 mph (rated TL-1)
3. Fit within the physical constraints required at the planned locations (2 feet wide by 15 feet long)

All components of the alternative crash cushion system and any required foundations shall be under manufacturer's recommendations.

A minimum of 15 days before to installation, you will furnish five copies of the manufacturer's plan and parts list.

The alternative temporary crash cushion must exhibit good workmanship, free from structural flaws and objectionable surface defects. The alternative temporary crash cushion need not be new. You may use good, used, undamaged alternative temporary crash cushion.

12-3.18C Construction

Secure the alternative temporary crash cushion in place before commencing a work activity requiring an alternative temporary crash cushion.

Maintain alternative temporary crash cushion in place at each location, including times when work is not actively in progress. You may remove alternative temporary crash cushion during the work period for access to the work if the exposed fixed obstacle is 15 feet or more from the nearest lane carrying traffic. Reset the crash cushion before the end of the work period. Remove alternative temporary crash cushions when no longer required.

Immediately repair alternative temporary crash cushion damaged due to your activities. Remove and replace any alternative temporary crash cushion damaged beyond repair. Repair of alternative temporary crash cushion damaged by traffic is change order work.

Attach a Type R or Type P marker panel to the front of alternative temporary crash cushion if the closest point of the crash cushion array is within 12 feet of the traveled way. Firmly fasten the marker panel to the crash cushion with commercial quality hardware or by other authorized methods.

Remove alternative temporary crash cushions, including foundations, and marker panels, when no longer required. Do not install alternative temporary crash cushion in the permanent work.

12-3.18D Payment

The Department does not pay alternative temporary crash cushion placed under section 7-1.04 or placed in excess of the number described.

A lateral move of alternative temporary crash cushion is change order work if ordered and the repositioning is not shown.

Add to section 12-4.02A:

During the setting and removing of temporary railing (Type K) , the road may be closed and traffic stopped for periods not to exceed 10 minutes. After 1 closure is made, all accumulated traffic must pass through the work zone before another closure is allowed.

Personal vehicles of your employees must not be parked on the traveled way or shoulders, including sections closed to traffic.

If work vehicles or equipment are parked within 6 feet of a traffic lane, close the shoulder area as shown.

A minimum of 1 traffic lane not less than 10 feet wide must be open for use by traffic.

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 with stationary and moving lane closures on 2-lane, 2-way highways. The traffic control system for a lane closure must comply with the details shown.

Traffic control system includes signs.

12-5.02 MATERIALS

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

NOT FOR CONSTRUCTION

Each attenuator must be individually identified with the manufacturer's name, address, attenuator model number, and a specific serial number. The name and number must be a minimum 1/2-inch high and located on the left, street side, lower front corner. The attenuator must have a message adjacent to the name and model number in 1/2-inch high letters with the blanks filled in by the attenuator manufacturer stating, "The bottom of this attenuator must be ___ ± ___ inches above the ground at all points for proper impact performance." Do not use an attenuator that is damaged or appears to be in poor condition until it is recertified by the manufacturer. The Engineer determines if a used attenuator supplied needs to be recertified. Each unit must be certified by the manufacturer to comply with the requirements for an attenuator under the standards established by METS.

A new attenuator design that is proposed as equal to the authorized attenuators must comply with the procedures established by METS, including crash testing. Contact METS for information regarding submittal of new designs for evaluation.

A new attenuator that is proposed as equal to the authorized attenuators or attenuators ordered for recertification must not be used until authorized by METS.

12-5.03 CONSTRUCTION

12-5.03A General

During traffic striping and pavement marker placement using bituminous adhesive, control traffic with a stationary or a moving lane closure. During other activities, control traffic with stationary lane closures.

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.

12-5.03B Stationary Lane Closures

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

12-5.03C Moving Lane Closures

A changeable message sign used in a moving lane closure must comply with section 12-3.12 except the sign must be truck-mounted. The full operational height to the bottom of the sign may be less than 7 feet above the ground but must be as high as practicable.

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

12-5.04 PAYMENT

Traffic control system for lane closure is paid for as traffic control system. Flagging costs are included in the payment for Traffic control system. Section 12-1.03 does not apply.

The requirements in section 4-1.05 for payment adjustments do not apply to traffic control system. Payment adjustments 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 adjustments 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.

NOT FOR CONSTRUCTION

Replace section 12-8 with:

12-8 TEMPORARY PAVEMENT DELINEATION

12-8.01 GENERAL

Section 12-8 includes specifications for placing, applying, maintaining, and removing temporary pavement delineation.

Temporary painted traffic stripes and painted pavement markings used for temporary delineation must comply with section 84-3.

12-8.02 MATERIALS

12-8.02A General

Not Used

12-8.02B Temporary Lane Line and Centerline Delineation

Temporary pavement markers must be the same color as the lane line or centerline markers being replaced. Temporary pavement markers must be temporary pavement markers on the Authorized Material List for short-term day/night use, 14 days or less, or long-term day/night use, 180 days or less. Place temporary pavement markers under the manufacturer's instructions.

12-8.02C Temporary Edge Line Delineation

Where edge lines are obliterated and temporary pavement delineation to replace those edge lines is not shown, provide temporary pavement delineation for:

1. Right edge lines consisting of (1) a solid 4-inch wide traffic stripe tape of the same color as the stripe being replaced, (2) traffic cones, or (3) portable delineators or channelizers placed longitudinally at intervals not exceeding 100 feet
2. Left edge lines consisting of (1) solid 4-inch wide traffic stripe tape of the same color as the stripe being replaced, (2) traffic cones, (3) portable delineators or channelizers placed longitudinally at intervals not exceeding 100 feet, or (4) temporary pavement markers placed longitudinally at intervals not exceeding 6 feet

12-8.02D Temporary Traffic Stripe Tape

If used, temporary traffic stripe tape must be one of the types of temporary, removable striping tape on the Authorized Material List.

12-8.02E Temporary Traffic Stripe Paint

Not Used

12-8.02F Temporary Pavement Marking Tape

Not Used

12-8.02G Temporary Pavement Marking Paint

You may use one of the types of temporary removable pavement marking tape or permanent pavement marking tape on the Authorized Material List instead of temporary pavement marking paint.

12-8.02H Temporary Pavement Markers

Not Used

12-8.03 CONSTRUCTION

12-8.03A General

Wherever work activities obliterate pavement delineation, place temporary or permanent pavement delineation before opening the traveled way to traffic. Place lane line and centerline pavement delineation for traveled ways open to traffic. On multilane roadways, freeways and expressways, place edge line delineation for traveled ways open to traffic.

Establish the alignment for the temporary pavement delineation including required lines or markers. Surfaces to receive an application of paint or removable traffic tape must be dry and free of dirt and loose material. Do not apply temporary pavement delineation over existing pavement delineation or other

NOT FOR CONSTRUCTION

temporary pavement delineation. Maintain temporary pavement delineation until it is superseded or you replace it with a new pattern of temporary pavement delineation or permanent pavement delineation.

When the Engineer determines the temporary pavement delineation is no longer required for the direction of traffic, remove the temporary pavement markers, underlying adhesive, and removable traffic tape from the final layer of surfacing and from the existing pavement to remain in place. Remove temporary pavement delineation that conflicts with any subsequent or new traffic pattern for the area.

12-8.03B Temporary Lane line and Centerline Delineation

Whenever lane lines or centerlines are obliterated and temporary pavement delineation to replace the lines is not shown, the minimum lane line and centerline delineation must consist of temporary pavement markers placed longitudinally at intervals not exceeding 24 feet. For temporary pavement markers on the Authorized Material List for long-term day/night use, 180 days or less, cement the markers to the surfacing with the adhesive recommended by the manufacturer except do not use epoxy adhesive to place the pavement markers in areas where removal of the markers will be required.

For temporary lane line or centerline delineation consisting entirely of temporary pavement markers on the Authorized Material List for short-term day/night use, 14 days or less, place the markers longitudinally at intervals not exceeding 24 feet. Do not use the markers for more than 14 days on lanes opened to traffic. Place the permanent pavement delineation before the end of the 14 days. If the permanent pavement delineation is not placed within the 14 days, replace the temporary pavement markers with additional temporary pavement delineation equivalent to the pattern specified or shown for the permanent pavement delineation for the area. The Department does not pay for the additional temporary pavement delineation.

12-8.03C Temporary Edge Line Delineation

You may apply temporary painted traffic stripe where removal of a 4-inch wide traffic stripe is not required.

The Engineer determines the lateral offset for traffic cones, portable delineators, and channelizers used for temporary edge line delineation. If traffic cones or portable delineators are used for temporary pavement delineation for edge lines, maintain the cones or delineators during hours of the day when the cones or delineators are being used for temporary edge line delineation.

Channelizers used for temporary edge line delineation must be an orange surface-mounted type. Cement channelizer bases to the pavement under section 85 for cementing pavement markers to pavement except do not use epoxy adhesive to place channelizers on the top layer of the pavement. Channelizers must be one of the 36-inch, surface-mounted types on the Authorized Material List.

Remove the temporary edge line delineation when the Engineer determines it is no longer required for the direction of traffic.

12-8.03D Temporary Traffic Stripe Tape

Apply temporary traffic stripe tape under the manufacturer's instructions. Slowly roll the tape with a rubber-tired vehicle or roller to ensure complete contact with the pavement surface. Apply the tape straight on a tangent alignment and on a true arc on a curved alignment. Do not apply the tape when the air or pavement temperature is less than 50 degrees F unless the installation procedures are authorized beforehand.

The temporary traffic stripe tape must be complete in place at the location shown before opening the traveled way to traffic.

12-8.03E Temporary Traffic Stripe Paint

Apply 1 or 2 coats of temporary traffic stripe paint for new or existing pavement.

The painted temporary traffic stripe must be complete in place at the location shown before opening the traveled way to traffic. Removal of painted temporary traffic stripe is required as shown.

NOT FOR CONSTRUCTION

12-8.03F Temporary Pavement Marking Tape

Apply temporary pavement marking tape at the locations shown. The tape must be complete in place at the location shown before opening the traveled way to traffic.

12-8.03G Temporary Pavement Marking Paint

Apply and maintain temporary pavement markings consisting of painted pavement markings at the locations shown. The painted temporary pavement marking must be complete in place at the location shown before opening the traveled way to traffic. Removal of painted temporary pavement marking is required between traffic stages when in conflict with traffic patterns.

Apply 1 or 2 coats of temporary pavement marking paint for new or existing pavement.

12- 8.03H Temporary Pavement Markers

Place temporary pavement markers under the manufacturer's instructions. Cement the markers to the surfacing with the manufacturer's recommended adhesive, except do not use epoxy adhesive in areas where removal of the pavement markers is required.

You may use retroreflective pavement markers specified in section 85 instead of temporary pavement markers for long term day/night use, 180 days or less, except to simulate patterns of broken traffic stripe. Retroreflective pavement markers used for temporary pavement markers must comply with section 85, except the waiting period before placing pavement markers on new HMA surfacing as specified in section 85-1.03 does not apply. Do not use epoxy adhesive to place pavement markers in areas where removal of the pavement markers is required.

Temporary pavement markers must be complete in place before opening the traveled way to traffic.

12-8.04 PAYMENT

Removal of temporary traffic stripe and removal of pavement marking is included in the payment for temporary delineation.

^^

13 WATER POLLUTION CONTROL

Add to section 13-3.01A:

The project is risk level 2.

Where Caltrans' SWPPP related forms, documents, and reports are referred to in section 13, you may use the equivalent forms, documents, and reports available at the California Stormwater Quality Association (CASQA) website.

https://www.casqa.org/

Your QSD is responsible for uploading all required documents and attachments into the **Storm Water Multiple Application and Report Tracking System** (SMARTS) as the project data submitter.

Add to section 13-4.01A:

Temporary fiber rolls and/or temporary silt fence may be required depending on your scheduling of operations.

NOT FOR CONSTRUCTION

Replace section 13-11 with:

13-11 WATER QUALITY MONITORING

13-11.01 GENERAL

Section 13-11 includes specifications for monitoring water quality during the following construction activities:

1. temporary creek diversion system
2. any other work within the stream flow of Hangtown Creek

The receiving water for this project is South Fork American River.

13-11.02 WATER QUALITY MONITOR

13-11.02A General

Assign a water quality monitor (WQM) to collect water samples and record water quality data. The WQM must be responsible for generating and submitting water quality reports.

Within 7 days after Contract approval, submit the WQM qualifications including training and experience in collecting and analyzing water quality samples.

The WQM must have the same qualifications as the WPC manager including the requirements for QSP and must have training and experience in collecting and analyzing water quality samples. The WQM may be the same person as the WPC manager.

If other personnel will be collecting water quality samples, their training must include:

1. SAP review
2. Health and safety review
3. Sampling simulations

If there is an unauthorized discharge, the WQM must immediately notify the Engineer within 6 hours.

13-11.02B Visual Inspections

The WQM must perform a visual inspection after each:

1. Storm event
2. Nonstormwater discharge as follows:
   - 2.1. Observe receiving waters:
     - 2.1.1. 24 hours before beginning in-water work including the installation of clear water diversions
     - 2.1.2. At least 4 times daily during in-water work activities including the installation, operation, and removal of clear water diversions
   - 2.2. Observe receiving waters for the presence of floating and suspended materials, sheen on the surface, discoloration, turbidity, odors, and sources of observed pollutants
   - 2.3. Observe the job site for the presence of authorized and unauthorized nonstormwater discharges and their sources. Unauthorized discharges to surface waters include:
     - 2.3.1. Soil, silt, and sand
     - 2.3.2. Bark, sawdust, and slash
     - 2.3.3. Rubbish and debris
     - 2.3.4. Cement, concrete, and concrete washings
     - 2.3.5. Oil and petroleum products
     - 2.3.6. Welding slag
     - 2.3.7. Other organic or earthen materials

The WQM must prepare a visual inspection report for each storm event and nonstormwater discharge. Each visual inspection report must include:

1. Name of personnel performing the inspection, inspection date, and date the inspection report is completed
2. Storm and weather conditions
3. Locations and observations

NOT FOR CONSTRUCTION

4. Corrective actions taken

Retain visual inspection reports at the job site.

13-11.03 WATER QUALITY SAMPLING AND ANALYSIS DAY

Water quality sampling and analysis day includes activities such as preparation, collection, analysis, and reporting of water quality samples.

This project is subject to the water quality objectives (WQO) shown in the following table:

Use for District 10, Central Valley RWQCB.

Water Quality Objectives

Parameter	Test Method	Detection limit (min)	Units	WQO
Turbidity (during activities for in-water work)	Field test with calibrated portable instrument (Measured at downstream sampling location)	1	NTU	15 NTU above natural background
Turbidity (during activities excluding in-water work)	Field test with calibrated portable instrument (Measured at downstream sampling location)	1	NTU	1. Where natural turbidity is less than 1 NTU, increases must not exceed 2 NTU. 2. Where natural turbidity is between 1 and 5 NTUs, increases must not exceed 1 NTU. 3. Where natural turbidity is between 5 and 50 NTUs, increases must not exceed 20 percent. 4. Where natural turbidity is between 50 and 100 NTUs, increases must not exceed 10 NTUs. 5. Where natural turbidity is greater than 100 NTUs, increases must not exceed 10 percent.
Settleable material	Observed	--	ml/L	Greater than 0.1 ml/L

NOT FOR CONSTRUCTION

Perform water quality sampling whenever a project activity, conducted within waters of the State, has the potential to mobilize sediment or alter background conditions within waters of the State. Perform surface water quality sampling when:

1. Conducting in-water work
2. Work activities result in materials reaching receiving waters
3. Work activities result in the creation of a visible plume in receiving waters

Comply with the equipment manufacturer's recommendation for sample collection, analysis methods, and equipment calibration.

At least 24 hours before starting in-water work:

1. Establish locations for water quality sampling:

1.1. Upstream of the effluent discharge point or location of in-water work by no more than 50 feet.
1.2. Effluent discharge point including location of in-water work.
1.3. Downstream of the effluent discharge point or location of in-water work no more than 300 feet.
2. Conduct water quality sampling to document background conditions for upstream, effluent, and downstream locations. Sample for each WQO shown in the table titled "Water Quality Objectives."
3. Estimate water flow.

Whenever conducting in-water work including the installation of a clear water diversion, conduct water quality sampling:

1. At least every 4 hours during in water work
2. At upstream, effluent, and downstream locations

If sample results exceed a WQO, immediately notify the Engineer within 30 minutes and:

1. Stop Work
2. Conduct water quality sampling every hour until measurements comply with WQOs
3. Measure the distance from the effluent location to the downstream extent of the exceedance
4. Obtain photos of the tributary upstream, downstream, and at the location of in-water work
5. If BMPs are installed, repaired, or modified to control the source of the exceedance, monitor the activity and document with samples, photos, and a brief summary

You are not required to physically collect samples under the following conditions:

1. During dangerous weather conditions such as flooding or electrical storms
2. Outside of normal working hours

If downstream samples show levels outside of the acceptable range and indicate a possible WQO exceedance, assess WPC practices, site conditions, and surrounding influences to determine the probable cause for the increase.

Retain calibration logs, water quality sampling documentation, and analytical results at the job site.

13-11.04 WATER QUALITY MONITORING REPORT

13-11.04A General

Submit a monthly water quality monitoring report by the 7th of the month for monitoring work conducted during the previous month. The report must include:

1. Visual inspection reports
2. If in-water work was done, the following field sampling results and inspections:
   2.1. Analytical methods, reporting units, and detection limits
   2.2. Date, location, time of sampling, visual observation, photos, and measurements
   2.3. Estimate of water flow
   2.4. Calibration logs for field monitoring equipment
3. If a storm event generates visible runoff, include visual inspections and sampling results with:
   3.1. Date, location, and time of visual observation
   3.2. Photos of areas disturbed by project activities including excess materials disposal areas
   3.3. Photos showing disturbed soil areas and documenting compliance for erosion control and revegetation measures including soil stabilization and sediment control BMPs
4. Summary of exceedance
5. Summary of corrective actions

13-11.04B Water Quality Objective Exceedance Report

If a WQO is exceeded, the WQM must:

1. Notify the Engineer by phone or electronic media within 30 minutes after WQO is exceeded
2. Submit a WQO exceedance report within 6 hours after WQO is exceeded

The report must include:

NOT FOR CONSTRUCTION

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, photos, and measurements
   1.3. Estimate of water flow
2. Description of BMPs and corrective actions taken to manage WQO exceedance

13-11.04C Additional Reports

Submit all sampling results to the Engineer within 5 days of taking the sample.

13-11.05 WATER QUALITY ANNUAL REPORT

Not Used

Add to section 13-6.03E:

Temporary fiber rolls and/or temporary silt fence shall be incorporated in your SWPPP as needed. Payment for temporary fiber rolls and/or temporary silt fence is included in the lump sum payment for construction site management.

^^

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).

Add to section 14-1.03B(3):

Signs must read: "Environmentally Sensitive Area - Area Off Limits."

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
Northwestern Pond Turtle
Yuma myotis bats
Red-shouldered Hawk
Brewer's Blackbird
Raptors

The Department anticipates nesting or attempted nesting by migratory and nongame birds from February 15 to September 1.

NOT FOR CONSTRUCTION

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-feet radius of the discovery or as defined in the table below. Immediately notify the Engineer. Do not resume activities until receiving notification from the Engineer.

Regulated species name	Protective radius
Birds of Prey	250-feet

14-6.02C(3) Protocols

Use protocols required by PLACs

14-6.02C(4) Biological Resource Information

Not Used

14-6.02C(5) Protection Measures

Not Used

14-6.02C(6) Monitoring Schedule

Not Used

14-6.02D Payment

Not Used

Replace section 14-6.05 with:

14-6.05 CONTRACTOR-SUPPLIED BIOLOGIST

14-6.05A General

14-6.05A(1) Summary

Section 14-6.05 includes specifications for providing a Contractor-supplied biologist to conduct pre-construction surveys, monitor construction and other activities to protect regulated species that may be harmed during construction activities.

14-6.05A(2) Submittals

14-6.05A(2)(a) Qualifications

Within 7 days after Contract approval, submit each biologist's name, resume, and statement of qualifications. Allow 15 days for review. If the submittal is incomplete, the Engineer will provide comments. Within 7 days after receiving the Engineer's comments, update and resubmit qualifications data. Do not start construction activities until the Contractor-supplied biologist is authorized.

14-6.05A(2)(b) Protocols

Not Used

NOT FOR CONSTRUCTION

14-6.05A(2)(c) Pre-Construction Survey Report

Submit a pre-construction survey report within 14 days before starting construction activities.

14-6.05A(2)(d) Initial Monitoring Report

Submit an Initial Monitoring Report that includes, at a minimum, the requirements for Monitoring Report submittals within 12 hours after starting ground-disturbing activities.

14-6.05A(2)(e) Monitoring Report

Not Used

14-6.05A(2)(e) Monitoring Report

Not Used

14-6.05A(2)(e) Monitoring Report

Not Used

14-6.05A(2)(f) Incident Report

Submit an Incident Report within 24 hours of the incident.

14-6.05A(2)(g) Annual Monitoring Report

Not Used

14-6.05A(2)(h) Final Monitoring Report

Submit no later than 20 days after completion of the project.

14-6.05A(3) Quality Control and Assurance

14-6.05A(3)(a) Qualifications

Not Used

14-6.05A(3)(b) Protocols

Use protocols required in PLACs.

14-6.05B Materials

Not Used

14-6.05C Construction

14-6.05C(1) General

Not Used

14-6.05C(2) Pre-construction Survey

Survey the work area for regulated species within 14 days before starting construction activities.

14-6.05C(3) Protective Radius

Not Used

14-6.05C(4) Monitoring Schedule

Monitoring must comply with the schedule in section 14-6.02.

14-6.05C(5) Monitoring Duties

The biologist must:

1. Monitor for regulated species within the project area.
2. Assure that construction activities do not result in take of regulated species.
3. Assure that construction activities comply with PLACs.
4. Immediately notify the Engineer of any take of regulated species.
5. Prepare, submit, and sign notifications and reports.

NOT FOR CONSTRUCTION

14-6.05C(6) Notification and Reporting

All reports must include the following:

1. PLAC requirement implementation
2. Name(s) of the biologist(s) conducting biological activity
3. Date(s) and time(s) of monitoring
4. Locations and activities monitored
5. Representative photographs
6. Findings
7. If regulated species are observed, reports must recommend actions to protect the regulated species
8. Name of the biologist who prepared the report
9. Signature of the biologist certifying the accuracy of the report

The Pre-Construction Survey Report includes one of the following:

1. Detailed observations and locations where regulated species were observed
2. Statement that no regulated species were observed by each biologist

The Incident Report includes:

1. Description of any take incident
2. Species name and number taken
3. Details of required notifications with contact information
4. Corrective actions proposed or taken
5. Disposition of taken species

The Annual Monitoring Report includes:

1. Construction beginning and ending dates
2. Identification of project impacts on the species covered in the plan
3. Species protection measures with protection measure implementation details
4. Incidental take details, including species name, number taken, people contacted, contact information, and disposition of taken species
5. An assessment of the effectiveness of the species protection measures to mitigate project impacts
6. Recommendations to improve efficiency of protection measures to mitigate impacts to regulated species

The Final Monitoring Report must be a cumulative report following the format of the Annual Monitoring Report.

14-6.05D Payment

Not Used

NOT FOR CONSTRUCTION

Replace the 2nd paragraph of section 14-8.02A with:

Do not operate construction equipment or run the equipment engines from 7:00 p.m. to 7:00 a.m. or on Sundays except you may operate equipment within the project limits during these hours to:

1. Service traffic control facilities
2. Service construction equipment

Add to section 14-9.02A

Notify the following agencies 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). Notification must take place not less than 10 days before starting demolition or renovation

activities as defined in the NESHAP regulations. Notification forms and other information are available from the California Air Resources Board web site at: http://www.arb.ca.gov/enf/oasse.htm#asb.

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

U.S. EPA, REGION IX
ASBESTOS NESHAP NOTIFICATION (AIR-5)
75 HAWTHORNE STREET
SAN FRANCISCO, CA 94105

Mail a copy or send a fax of the notification form and any necessary attachments to:

CALIFORNIA AIR RESOURCES BOARD
ENFORCEMENT DIVISION
ASBESTOS NESHAP NOTIFICATION
POST OFFICE BOX 2815
SACRAMENTO, CA 95812
Fax: (916) 445-7986

Notify other local permit agencies and utility companies before starting any demolition activities. Submit a copy of the notification form and attachments as an informational submittal before starting demolition or renovation activities.

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

Replace section 14-9.03 with:

14-9.03 DUST CONTROL

14-9.03A GENERAL

14-9.03A(1) Summary

Section 14-9.03 includes specifications relating to dust control.

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

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

The materials within the project limits are neither known nor suspected to contain naturally occurring asbestos and the project is not located within designated Naturally Occurring Asbestos Review Areas on the current El Dorado County Naturally Occurring Asbestos Review Area Map. Analytical results of soil and rock testing for NOA are included in the *Information Handout*.

14-9.03A(2) Submittals

Submit a site specific Fugitive Dust Control Plan / Fugitive Dust Plan (FDP) for all proposed work, meeting the requirements of Dust Rules and approved by AQMD, to the AQMD prior to start of any work. Provide the Engineer with four (4) copies of the AQMD approved FDP prior to starting any work that may generate dust.

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

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

NOT FOR CONSTRUCTION

Provide all notices to the AQMD and create and maintain all records as required by Dust Rules. Copies of all related records must be submitted to the Engineer within thirty (30) calendar days of completion of the work.

14-9.03B Materials

Not used.

14-9.03C Construction

Implement the measures contained in the FDP to control dust.

Control dust using measures that include the following:

1. Stabilize unpaved areas subject to vehicular traffic by keeping adequately wetted, or covered with material that contains less than 0.25 percent asbestos.
2. The speed of vehicles and equipment traveling across unpaved areas must not be more than 15 mph unless the road surface and surrounding area is sufficiently stabilized to prevent vehicles and equipment going faster from causing dust that is visible from crossing job site limits.
3. Stockpiles and disturbed areas not subject to vehicular traffic must be located in the plan and stabilized by being kept adequately wetted, or covered with material that contains less than 0.25 percent asbestos.
4. Conduct activities so that no dirt or mud tracking is visible on any paved roadway open to the public.
5. Use rock track out pads and wheel wash stations at all points of egress from unpaved construction areas.
6. Use a dedicated water truck for each piece of earthmoving equipment (e.g., scrapers, dozers, excavators, loaders, haul trucks, backhoes, compactors, graders, etc),
7. Pre-wet excavations to depths of cuts.

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

14-9.03D PAYMENT

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

If naturally occurring asbestos is found within the project limits, prepare an Asbestos Dust Mitigation Plan. Preparing an Asbestos Dust Mitigation Plan and its implementation is change order work.

Payment for implementing, preparing, obtaining approval for, revising, and amending the FDP, for AQMD FDP review fees, and for maintaining and submitting all dust control records is included in the various contract items.

NOT FOR CONSTRUCTION

Replace section 14-11.06 with:

14-11.06 DEPARTMENT GENERATED CONTAMINATED SOIL AND GROUNDWATER

14-11.06A General

Petroleum hydrocarbons, chlorinated ethene and related constituents and potentially heavy metals impacted soils exist throughout the job site.

14-11.06A General 14-11.06A(1) Summary

Section 14-11.06 includes specifications for handling petroleum hydrocarbon, chlorinated ethene and potentially metal-impacted soil, and handling of impacted groundwater generated during excavation activities and from general construction operations. Contaminated soil and groundwater may be encountered on Blairs Lane (from station 107+25 to 108+60) and along Broadway, through general excavation activities, installation of storm drain systems, utility trenching, and construction of Abutment 2, including the spread footing.

14-11.06A(2) Definitions

Constituents of Concern (COCs):

Soil COCs -- petroleum hydrocarbons, chlorinated ethenes and/or CAM 17 metals..

Groundwater COCs -- petroleum hydrocarbons and chlorinated ethenes.

CAM 17 metals - antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, mercury, molybdenum, nickel, selenium, silver, thallium, vanadium, zinc).

Type DC material: Material excavated from Blairs Lane north of the bridge and material excavated from Broadway *suspected* of being contaminated with COCs. Contaminated material may be encountered during excavation within the project limits as shown and described in the Preliminary Site Investigation report included in the *Information Handout*. Analytical testing is required consistent with the El Dorado County Environmental Health Permit and by the disposal/recycling facility. Type DC material may or may not be hazardous, but must be analyzed prior to reuse or disposal.

Type DC Metal material: Soils below the bridge as referenced in Section 7-1.02K(6)(j)(iv) and Section 14-11.08A. Lead-impacted soils have been identified and other CAM 17 metals may present within the project area due to historic mining activity. Presence and distribution of CAM 17 metals, if any, will be assessed by analytical testing as provided for in Sections 14-11.06A(4)(c) and 14-11.06A(4)(d)).

Type GC Dewatering: Petroleum hydrocarbon- and/or chlorinated ethene-impacted groundwater from excavation, at the locations shown, requiring containerization, treatment and/or disposal. Analytical testing is required consistent with the El Dorado County Environmental Health Permit and by the disposal/recycling facility.

California Registered Environmental Professional: A third-party California registered environmental professional will be retained by the City to perform analytical testing and characterization of Type DC material, Type DC metal material, and Type GC Dewatering. They will also oversee disposition and handling of Type DC, Type DC and GC material.

14-11.06A(3)Site Conditions

A Preliminary Site Investigation (PSI) report dated February 25, 2015, containing the analytical test results for soil and groundwater samples are included in the *Information Handout*. A Risk Management Plan for Soil and Groundwater providing recommendations for handling of petroleum hydrocarbon- and chlorinated ethene-impacted soil and groundwater are included *Information Handout*. With the exception of lead, the project site has not been tested for CAM 17 COCs.

Groundwater may occur at any depth below existing grade.

14-11.06A(4)

Submittals 14-11.06A(4)(a) Health and Safety Plan

**** cd 3/23/15**

Submit a site specific health and safety plan, signed by a CIH, for site personnel. Identify potential health and safety hazards associated with work involving (1) asbestos, (2) petroleum hydrocarbons, chlorinated ethenes and metals impacted soil, and (3) petroleum hydrocarbons and chlorinated ethenes impacted groundwater that will be used to protect workers from those hazards in conformance with Title 8 and 22 of the CA Code of Regs. The health and safety plan must:

1. Identify key site safety personnel
2. Describe risks associated with the work
3. Specify training requirements
4. Specify appropriate personal protective equipment
5. Specify site-specific medical surveillance requirements
6. Specify air monitoring requirements
7. Define appropriate site work zones
8. Specify decontamination requirements

Submit the Health and Safety Plan at least 10 days prior to beginning work for review and acceptance by

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the Resident Engineer.

14-11.06A(4)(b) Safety Training Certification

Provide a certification of completion of the safety training program for personnel.

14-11.06A(4)(c) Excavation and Dewatering Plan

Submit an Excavation, Transportation and Dewatering Plan (ETDP) for the excavation and stockpiling of Type DC, Type DC Metal, and GC material. Comply with 7-1.02K(6)(j)(iv). Submit the plan at least 15 days prior to beginning excavation/dewatering work for review and authorization by the Engineer. Allow 5 days for the department to review and authorize the ETDP. If revisions are required, as determined by the Department, revise and resubmit the ETDP within 5 days of receipt of the Department's comments and allow 5 days for the Department to review the revisions. Excavation will not be allowed until the Department authorizes the ETDP.

The plan must comply with Cal/OSHA regulations. The excavation and dewatering plan must include the following elements:

1. Excavation and dewatering schedule for type DC and GC material by location and date
2. Storage containers (bins) and Baker Tanks, and containerization procedure.
3. Dewatering methods and procedures.
4. Dewatering equipment and storage in USDOT approved containers.
5. Location of dewatering holding tanks
6. Temporary storage location
7. Storage, access and haul route for disposal truck
8. Disposal truck loading area
9. Dust control measures
10. Transportation equipment and routes
11. Method for preventing spills and tracking material onto public roads
12. Truck waiting and staging areas
13. Site for disposal of Type DC and GC material
14. Example of bill of lading to be carried by trucks transporting Type DC and GC material. The bill of lading must include:
    - 14.1. US Department of Transportation (US DOT) description including shipping name
    - 14.2. Hazard class
    - 14.3. Identification number
    - 14.4. Handling codes
    - 14.5. Quantity of material
    - 14.6. Volume of material
15. Spill Contingency Plan for Type DC and GC material

14-11.06A(4)(d) Type DC, DC Metal and CG Materials Laboratory Analytical Results

Samples of Type DC, DC Metal and CG material will collected by the California registered environmental professional consistent with the El Dorado County Environmental Health Permit for the project. A copy of the analytical test results of COCs in soil and groundwater, including chain of custody documentation, must be obtained from the California registered environmental professional and must be submitted to the Resident Engineer before removing soil and water from the job site.

14-11.06A(4)(e) Type DC, DC Metal and CG Material Disposal Documentation

Comply with all PLACS.

Analytical testing of Type DC, DC Metal and CG material will be performed by the City in conjunction with soil excavation and dewatering activities, allow 2 days for results of analytical testing before transporting, disposing or reusing the material. Submit the following within 5 days of transport:

1. Volume of soil in cubic yards and volume of groundwater in gallons

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2. COCs and analytical results
3. Location material was excavated/dewatered from
4. Final disposition (disposal facility, date and documentation from the receiving facility)

Additional requirements for handling of DC Metal material are discussed in 14-11.08B(8).

14-11.06A(4)(f) Lead Compliance Plan

Submit a Lead Compliance Plan in accordance with Section 7-1.02K(6)(j)(ii).

14-11.06A(4)(g) Permit Application

The California registered environmental professional will obtain a permit from the El Dorado County Environmental Management Department for Site Assessment/Remediation. The City will sign the application. Provide the California registered environmental professional with all required attachments.

14-11.06A(5) Notifications

Notify the Resident Engineer or the California registered environmental professional providing 3rd party oversight that a stockpile of Type DC, DC Metal or GC material is ready for sampling. Notify no later than 24 hours after stockpiling or dewatering.

14-11.06A(6) Quality Control and Assurance

Excavation, handling, and management of Type DC material and management and disposal of type GC groundwater must comply with the requirements of the following agencies:

1 Central Valley RWQCB
2 El Dorado County Air Quality Management District
3 CAL/OSHA
4 El Dorado County Environmental Health Department
5 DTSC
6 California Air Resources Board

Laws and regulations that govern this work include:

1 Water Code, Division 7
2 Title 8, CA Code of Regs
3 Title 22, CA Code of Regs

14-11.06B Materials

Not Used

14-11.06C Construction

14-11.06C(1)General

Not Used

14-11.06C(2) Health and Safety Training Program

Before starting any activity that presents the potential for petroleum and metals exposure to employees including Department employees, provide a safety training program to these employees that communicates potential health and safety hazards associated with work involving petroleum impacted soil and instructs personnel in procedures for doing the work safely. Provide subsequent training required until completion of work. The level of training provided must be consistent with the person's job function and must conform to OSHA and CAL/OSHA regulations.

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Supply training, personnel protective equipment, and medical surveillance required by the health and safety plan to 2 City personnel. Continuously monitor the excavation site as it is excavated, using appropriate air monitoring devices consistent with your health and safety plan.

14-11.06C(3) Excavation

Notify the engineer 5 days before starting any excavations where Type DC, Type DC Metal and/or Type GC material are shown.

Type DC, DC Metal and GC materials must be segregated and not mixed with material not suspected of contamination.

Transfer Type DC metal material directly to a drum or stockpile in accordance with section 14-11.08 and section 7-1.02K(6)(j)(iv).

Transfer Type DC material directly from the excavation to an approved stockpile location on the job site or storage container approved for transport of contaminated material by the United States Department of Transportation.

Prevent the flow of surface runoff from entering the excavation areas.

Notify the Engineer and California registered environmental professional after Type DC material has been excavated and stockpiled. The stockpile will be sampled by the California registered environmental professional. Maintain adequate access for sampling by other forces at all times.

Notify the Engineer after the Type DC Metal soil is excavated to the depths indicated in Section 7-1.02K(6)(j)(iv) and drummed or stockpiled. The Type DC Metal material will be sampled by the California registered environmental professional from the drum or stockpile location. Maintain adequate access for sampling by other forces at all times.

If the soil analysis of Type DC material is such that it can be reused on the jobsite, the material becomes your property to use or dispose of.

Continuously monitor the excavation site and excavated Type DC and Type DC Metal material as it is excavated, using appropriate air monitoring devices consistent with your health and safety plan

14-11.06C(4) Reserved

14-11.06C(5) Dewatering

You are responsible for dewatering activities and management of the GC material generated. If groundwater or perched groundwater is encountered during excavation activities immediately notify the Engineer.

Pump and store groundwater encountered during excavation activities into a holding tank. Use submersible pumps capable of discharging water and other materials, including small rocks, gravel, sand and sediments. Holding tank for dewatering activity must be transportable and totally enclosed with an inlet and outlet capable of receiving and discharging minimum flows. Holding tanks must accommodate temporary installation of submersible pumps of such capacity to discharge water. Displaced groundwater must not be allowed to flow from the immediate work area.

Conduct a daily inspection of the dewatering equipment, when in use, to ensure that all components are functional and routinely maintained to prevent leakage. Should any component of the dewatering equipment be damaged or affect the performance of the equipment, immediately discontinue the dewatering operation and repair the component or replace it with substitute equipment.

Comply with the provisions of the NPDES General Permit for *Storm Water Discharges Associated with*

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Construction and Land Disturbance Activities (Order No. 2009-0009-DWQ, NPDES No. CAS000002). You are responsible for penalties assessed or levied on you or the City as a result of your failure to comply with the provisions in this section and as specified in section 7-1 and section 19-2.

The water will be sampled by the California registered environmental professional and analyzed within 5 days after completing dewatering activities or filling a holding tank in compliance with disposal facility requirements. Maintain adequate access for sampling by other forces at all times.

14-11.06C(6) Disposal

Dispose of the DC, DC Metal and GC material found to contain hazardous levels of COCs in accordance with PLACS at appropriate California permitted facilities after laboratory analysis results are accepted.

Collect and dispose of used non-reusable protective equipment at an appropriately permitted disposal facility.

14-11.06D Payment

Type DC metals excavation is measured as specified for roadway excavation in section 19-2.04.

Excavation of type DC material will be measured and paid for in accordance with the measurement and payment of the various bid items requiring the excavation.

Transportation and disposal of type DC material that is identified by the California registered environmental professional
Payment for dewatering, treatment for turbidity or other water quality requirements not related to COCs, storage and disposal of groundwater that is not considered hazardous or contaminated by COCs is included in the payment for the various bid items.

Treatment, transportation and disposal of dewatered groundwater (Type GC) to a permitted recycling facility is change order work.

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 and handling of Type DC metal material.

The existing paint system on bridge number 25C0012 and the soil underlying the bridge contains lead. Additionally, as a result of historical mining in the area, soils may contain other metals. Any work that disturbs the existing paint system or soil below the bridge 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.

Soil directly underlying the bridge and adjacent to the bridge for five (5) feet in either direction upstream or downstream from the bridge, from the soil surface to two (2) feet below ground surface, is impacted with lead derived from flaking paint on the bridge. The soil should be handled in the same manner as described for debris. Refer to Section 7. 7-1.02K(6)(j)(iv) for additional information regarding handling of soils impacted with lead.

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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 in accordance with Section 7-1.02K(6)(j)(ii).

. **14-11.08B(4) Air Monitoring Reports**

Submit air monitoring reports, including test results for samples taken after corrective action:

1. Verbally within 48 hours after sampling
2. As an informational submittal within 5 days after sampling

Air monitoring reports must include:

1. Date and location of sample collection, sample number, contract number, bridge number, full name of the structure, and District-County-Route-Post mile
2. Name and address of the certified laboratory that performed the analyses
3. Chain of custody documentation
4. List of emission control measures in place when air samples were taken
5. Air sample results compared to the appropriate permissible exposure limit (PEL)
6. Corrective action recommended by the California registered environmental professional to ensure exposure to airborne metals outside containment systems and work areas is within specified limits
7. Signature of the California registered environmental professional who reviewed the data and made recommendations

14-11.08B(5) Soil Sampling Results for Debris Containment Verification

Following containment of the paint system and the removal of the upper two (2) feet of soil underlying the bridge and to five (5) feet in either direction either direction upstream or downstream from the bridge, notify California registered environmental professional of DC Metal material drum or stockpile location consistent with 14-11.06C(3). The California registered environmental professional will sample the material for total lead, and soluble lead relative to California and Federal guidelines (STLC and TCLP).

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The California registered environmental professional will sample material and provide analytical results within 2 days. Dispose of paint and DC Metal soil at Class 1, Class 2 or Class 3 landfill as appropriate based on analytical concentrations.

Soil sampling results provided to you by the California registered environmental professional will include:

1. Date and location of sample collection, sample number, contract number, bridge number, full name of the structure and District-County-Route-Post mile
2. Concentrations of CAM 17 metals expressed in mg/kg and mg/L
3. Name and address of the certified laboratory that performed the analyses
4. Chain of custody documentation

14-11.08B(6) Waste-Characterization Test Results

Submit waste-characterization test results for the paint debris, DC Metal material 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 to the Resident Engineer within 5 business days of transporting debris from the project as indicated in 14-11.06C(6).

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 2 City 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

The California registered environmental professional will monitor the ambient air and soil in and around the work area to verify the effectiveness of the containment system. Work area monitoring includes:

1. Collecting, analyzing, and reporting air and soil test results
2. Recommending corrective action when specified air or soil concentrations are exceeded

Collect air and soil samples at locations designated by the Engineer.

14-11.08D(2) Air Monitoring

Air monitoring must be performed under the direction of a California registered environmental professional.

NOT FOR CONSTRUCTION

Collect and analyze air samples to detect lead under the National Institute of Occupational Safety and Health (NIOSH) Method 7082 using a detection limit of at least 0.05 µg/m^3. Collect and analyze air samples to detect other metals under NIOSH Method 7300 using a detection limit of at least 1 percent of the appropriate PEL specified by Cal/OSHA. You may use alternative methods of sampling and analysis with equivalent detection limits.

Concentrations of airborne metals outside containment systems and work areas must not exceed any of the following:

1. Average of 1.5 µg/m^3 of air per day and 0.15 µg/m^3 per day on a rolling 90-day basis. Calculate average daily concentrations based on monitoring to date and projections based on monitoring trends for the next 90 days or to the end of work subject to the lead compliance plan if less than the specified averaging period.
2. 10 percent of the action level specified for lead by 8 CA Code of Regs §1532.1.
3. 10 percent of the appropriate PELs specified for other metals by Cal/OSHA.

Collect air samples daily during work activities that disturb the existing paint system. Air samples must be analyzed within 48 hours by a facility accredited by the Environmental Lead Laboratory Accreditation Program of the American Industrial Hygiene Association. If concentrations of airborne metals exceed allowable levels, modify the containment system or work activities to prevent further release of metals. If the CIH recommends corrective action, collect and analyze additional samples after implementing the corrective action unless directed otherwise.

14-11.08D(3) Soil Sampling for Debris Containment

The California registered environmental professional will collect soil samples from the soil excavation area within 36 hours after paint is removed from existing wood and steel and soil underlying bridge is excavated and drummed/stockpiled. Soils will be analyzed for:

1. CAM 17 metals by US EPA Method 6010B or US EPA Method 7000 Series
2. Soluble CAM 17 metals by California Waste Extraction Test (CA WET STLC)
3. Soluble CAM 17 metals by EPA 1311 Waste Extraction Test (TCLP)

After removal of debris and Type DC Metal material, concentrations of heavy metals in the soil of the work area must not exceed environmental screening levels recommended by El Dorado County Environmental Health. If soil sampling results exceed el Dorado County Environmental Health screening levels:

1. Excavate an additional foot of soil (or until bedrock is encountered) below the bridge and 5 feet upstream and downstream of the bridge.
2. Resample until soil sampling and testing shows concentrations of heavy metals less than or equal to environmental screening levels recommended by El Dorado County Environmental Health.

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 debris must be removed.

14-11.08E Debris Management

Implement paint containment plan and remove paint from existing wood and steel bridge components. Excavate soils from surface to 2 feet below ground surface below the bridge and within 5 feet upstream and downstream of the bridge and place into drums/stockpile with appropriate control methods to prevent migration of soil.

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

NOT FOR CONSTRUCTION

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 3 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 5 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 performed by the CAM 17 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 the guardrail, the bridge deck and sign posts 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

NOT FOR CONSTRUCTION

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. City 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. City 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

NOT FOR CONSTRUCTION

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
4. 1 year of generation if storing in a storage building as defined in 22 CA Code of Regs, Div. 4.5, Chp. 34, § 67386.6(a)(2)(C)

14-11.09D Payment

Not Used

Replace section 14-11.11 with:

14-11.11 MANAGEMENT OF ASBESTOS CONTAINING MATERIALS

14-11.11A General

14-11.11A(1) Summary

Section 14-11.11 includes specifications for removal, and disposal of asbestos-containing material (ACM). Friable ACM generated as part of this work is Department-generated hazardous waste under 14-11.02F.

14-11.11A(2) Definitions

asbestos: Includes chrysotile, amosite, crocidolite, tremolite, anthrophyllite, actinolite and any of these minerals that has been chemically treated and/or altered.

asbestos-containing material (ACM): Any building material, including asbestos cement pipe containing commercial asbestos in an amount greater than 1% by weight, area, or count.

certified asbestos consultant (CAC): An asbestos consultant certified by Cal/OSHA under 8 CA Code of Regs § 341.15 and 1529.

regulated asbestos-containing material (RACM): any material containing more than one percent friable asbestos as determined using Polarized Light Microscopy (PLM), that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure. Includes Category I non-friable ACM which has become friable, or will be subjected to sanding, grinding, cutting or abrading; or Category II non-friable ACM which may become or has become friable.

friable ACM: Any material containing more than 1 percent asbestos by area that hand pressure can crumble, pulverize or reduce to powder when dry".

non-friable ACM: Asbestos fibers are tightly bound into the matrix of the material and should not become an airborne hazard as long as the material remains intact and undamaged, and is not sawed, sanded, drilled or otherwise abraded during removal (Asbestos Hazard Emergency Response Act (AHERA).

14-11.11A(3) Asbestos Survey Results

Asbestos was detected at Blairs Lane Bridge over Hangtown Creek in Placerville, California. The complete report entitled “PRELIMINARY SITE INVESTIGATION” is available in the *Information Handout*

NOT FOR CONSTRUCTION

14-11.11A(4)(c) Air Quality Management District (AQMD) or Air Pollution Control District (APCD) Notification of Demolition

Submit a copy of the NESHAP notification form and attachments to the Engineer, required under section 14-9.02, before submittal to the AQMD or APCD under 40 CFR §61.145(b).

14-11.11A(4)(d) Asbestos Compliance Plan

Prepare an Asbestos Compliance Plan (ACP) to prevent or minimize exposure to asbestos during removal work. The ACP must be signed by a CIH before submission to the Engineer for review and authorization. Submit the ACP to the Engineer at least 15 business days before beginning removal work in areas containing or suspected to contain asbestos. The ACP must contain:

1. Identification of key personnel for the project
2. Scope of work and equipment that will be used
3. Job hazard analysis for work assignments
4. Summary of risk assessment
5. Personal protective equipment
6. Delineation of work zones on-site
7. Decontamination procedures
8. General safe work practices
9. Security measures
10. Emergency response plans
11. Worker training
12. Certification of completion of safety training for all trained personnel before starting work in areas containing or suspected to contain asbestos.

14-11.11A(4)(e) Removal Work Plan

Prepare a work plan for the removal, storage, transportation and disposal of ACM. Allow up to 10 days for Engineer to review and authorize.

The work plan must include:

1. Installing asbestos warning signs at perimeters of abatement work areas
2. Summary of methods and techniques for handling, packaging, labeling, storing, transporting and disposing of waste materials
3. Wetting asbestos materials with sprayers
4. Containing large volumes of asbestos materials in disposal bins for temporary storage until removed from the site
5. Providing manifests for disposal upon completion for the Engineer to sign
6. Providing transporters registered to transport hazardous waste in the state of California under the Health and Safety Code Ch 6.5, Div 20 and 22 CA Code of Regs, Div 4.5
7. Disposing of asbestos materials at an appropriately permitted disposal facility in California
8. Compliance with federal, state, and local requirements for asbestos work, transport, and disposal

14-11.11A(4)(f) ACM Removal Report

Submit ACM Removal Report to Engineer and APCD or AQMD within 30 days after ACM is removed from job site. ACM Removal Report must address all items in work plan.

14-11.11A(5) Quality Control and Assurance

14-11.11A(5)(a) Qualifications

The person in charge of asbestos removal and abatement planning must be a CAC.

The CAC in charge of asbestos removal must be registered under Labor Code § 6501.5 and certified under Bus & Prof Code § 7058.6.

Laboratories used to perform asbestos analysis must be certified by the CDPH Environmental Laboratory Accreditation Program for all analyses to be performed.

NOT FOR CONSTRUCTION

14-11.11A(5)(b) Regulatory Requirements

Codes which govern removal and disposal of materials containing asbestos include:

1. CA Health and Safety Code, Division 20, Chapter 6.5, Hazardous Waste Control
2. 8 CA Code of Regs, General Industry Safety Order 5208 Asbestos
3. 8 CA Code of Reg, § 1529 and 341
4. 22 CA Code of Regs, Division 4.5
5. Cal/OSHA, Part 26 (amended), of 29 CFR
6. 40 CFR, Part 61, subpart M

14-11.11B Materials

Not used

14-11.11C Construction

14-11.11C(1) General

Notify the APCD or AQMD of changes in work locations or conditions.

Before starting work in areas containing or suspected to contain asbestos, provide safety training to State personnel who may enter the work area that meets the requirements of 8 CA Code of Regs § 1529.

Provide training, personal protective equipment, and medical surveillance required by the Asbestos Compliance Plan to City personnel.

14-11.11C(2) Unanticipated Suspected ACM discovered During Demolition or Excavation

If unanticipated ACM is discovered during demolition, stop portion of work in ACM area and notify the Engineer. ACM will be removed by the registered professional hired by the contractor.

Notify the APCD or the AQMD of changes to removal or demolition plans, including discovery of ACM during demolition, within 2 business days of the change.

Removal and disposal of ACM not identified in the ACM survey prior to demolition or renovation is change order work.

14-11.11C(3) Removal

Comply with 8 CA Code of Regs § 1529 and § 341. Remove friable ACM using the wetting method. Remove and handle all non-friable ACM to prevent breakage. The removal of ACM encased in concrete or other similar structural material is not required before demolition, but the ACM must be adequately wetted whenever exposed during demolition. Prevent visible emissions from all ACM removal activities.

Mark all regulated work areas with the following or equivalent warning:

DANGER

ASBESTOS

CANCER AND LUNG DISEASE HAZARD

AUTHORIZED PERSONNEL ONLY

14-11.11C(4) Packaging

Comply with 22 CA Code of Regs, Div 4.5, Chapter 12, Article 3 requirements for packaging and labeling removed ACM. Place removed ACM in approved containers (double ply, 0.06-inch minimum thickness, plastic bags) with caution labels affixed to bags. Caution labels must have conspicuous, legible lettering, that spells out the following or equivalent warning:

NOT FOR CONSTRUCTION

DANGER

CONTAINS ASBESTOS FIBERS

AVOID CREATING DUST

CANCER AND LUNG DISEASE HAZARD

Place removed materials containing asbestos directly into a covered, lockable roll off or drop box that has the same caution label affixed on all sides.

If hazardous waste is removed, submit a copy of the hazardous waste manifest for each shipment of hazardous waste. The Engineer will sign all manifests as the generator.

14-11.11C(5) Transportation

All haulers of friable ACM must have current registration with DTSC for transporting hazardous waste and must have a U.S. Environmental Protection Agency Identification Number (U.S. EPA I.D. Number). All vehicles used to transport hazardous waste material must carry a valid registration during transport. Transport non-friable (non-hazardous waste) ACM to the disposal facility with a shipping document or waste shipment record.

14-11.11C(6) Disposal

Dispose of friable and non-friable waste containing asbestos at a disposal facility permitted to accept the waste and that meets all the requirements specified by federal, state and local regulations. Notify the proper authorities at the disposal site in advance of delivery of ACM.

Submit documentation from disposal facility indicating proper disposal of all hazardous ACM waste and nonhazardous ACM waste within 5 days of transporting the waste from the job site.

14-11.11D Payment

Not Used

^^

15 EXISTING FACILITIES

Delete the 4th paragraph in section 15-2.02B(2)

Replace section 15-2.02B(3) with:

15-2.02B(3) Cold Planing Asphalt Concrete Pavement

15-2.02B(3)(a) General

Not Used

15-2.02B(3)(b) Materials

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

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:

NOT FOR CONSTRUCTION

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

Not Used

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.

Add to section 15-2.02G:

Resetting end cap from portion of removed guardrail must be placed at the end of the remaining portion of guardrail.

Replace section 15-2.02M with:

15-2.02M Remove Sewer Facilities

Sewer manholes and pipes must be completely removed if any portion of these structures is (1) within 3 feet of the grading plane in excavation areas, (2) within one foot of original ground in embankment areas, or (3) shown to be removed. Except for concrete pipe, removing PCC components of sewer facilities must comply with section 15-3.

NOT FOR CONSTRUCTION

Replace section 15-2.05C with:

15-2.05C Abandon Culverts

15-2.05C(1) General

Abandon culverts by removing portions of the culverts, filling the inside, and backfilling the depressions and trenches to grade. As an alternative to abandoning a culvert, you may remove the culvert, dispose of it, and backfill.

Notify the Engineer before abandoning a culvert.

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 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.

Culverts 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 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 is required, payment for backfilling inside the culverts is included in the payment for abandon culvert. Payment for backfilling outside the culvert is included in the payment for abandon culvert.

NOT FOR CONSTRUCTION

Replace section 15-2.05F with:

15-2.05F Abandon Monitoring Well

Abandon monitoring wells as shown.

The top portion of the monitoring well must be removed to a depth of 3 feet below finished grade.

Backfill must comply with section 19-3.03E.

Replace section 15-2.07F with:

15-2.07F Modify Irrigation System

Within the Caltrans parcel (approx 106+00 to 106+75 rt) modify irrigation system by relocating 3 sprinkler heads, replacing approximately 175-feet of irrigation line and reconnecting to the existing system. Irrigation line must be new and at least the same size as the existing line it is replacing.

Comply with section 20-2 of the RSS.

Replace section 15-2.08D with:

15-2.08D Reset Light Pole and Relocate Electrical Box

Remove existing electrical box foundation to a depth of at least 3 feet below the adjacent finished grade. Foundations include anchor bolts, reinforcing steel, conduit, and electrical wiring. All materials for relocating the electrical box must be new.

Electrical work must comply with section 86.

Replace section 15-2.09F with:

15-2.09F Relocate Mailbox

Mailboxes include newspaper boxes. Provide access for the mail and newspaper delivery at all times. Relocate the mail box location as necessary during your work. Mount mailboxes on posts that are set in the ground. If authorized, temporary supports may be used. Do not use posts concreted in buckets for temporary supports.

Relocate the newspaper box wherever the newspaper box is attached to the existing facility.

For the final location, install mailboxes on new redwood posts that comply with the specifications for sign posts under section 56.

Backfill the space around posts with earth material. Place the backfill in 4-inch thick layers. Moisten and thoroughly compact each layer.

Dispose of posts, mounts, and hardware that are no longer used.

Delete the 4th paragraph of section 15-3.01 in the RSS for section 15-3.01.

Add to the end of the sentence in the 1st paragraph of section 15-4.01A(1):

and concrete check dams.

Replace the 4th paragraph in section 15-4.01A(2) with:

Calculations for the removal plan must demonstrate the stability of the structure during each stage of removal. Include dead and live loads used in the design of protective covers.

Add to the 4th paragraph of section 15-4.01C(3)(a):

Completely remove the concrete check dam.

^^

DIVISION III GRADING

16 CLEARING AND GRUBBING

Add to section 16-1.01:

Tree trimming and removal is restricted to September 2 thru February 14.

NOT FOR CONSTRUCTION

Add to section 16-1.03A:

Protect in place the tree-s designated to remain within the construction area.

Replace the 4th paragraph in section 16-1.03A with:

Clear and grub vegetation only within the excavation and embankment slope lines.

^^

19 EARTHWORK

Add to section 19-1.01A:

8. Excavating and replacing Type DC and Type DC metal materials

Hardrock is expected during excavation for structure footing and sewer line trench excavation.

Contaminated soil and groundwater may be encountered in any excavations. Comply with sections 14-11.06 and 14-11.08

You should be aware of the potential issues and limitations with the PG&E transmission tower foundation, see the PG&E Utility Pole Stability Analysis Memorandum in the *Information Handout*. You must independently verify the stability of the PG&E transmission tower pole and its foundation and provide shoring if required.

Effort should be made to avoid unnecessary excavations performed around the foundation.

Before excavating in the area of the transmission tower submit an excavation plan to the Engineer for review.

Add section 19-1.03F Transmission Tower Surveys:

Excavation near the PG&E transmission tower requires pre-construction and post-construction surveys of the tower to ensure activities do not result in any appreciable deflections of the foundation and structure. Monitor the foundation movement daily until excavation has been backfilled. Provide the Engineer with a copy of all documents.

The excavated area must be backfilled with compacted to 95% relative compaction in the area of the tower.

Add to section 19-1.04:

Payment for Transmission tower surveys is not included in the payment for excavation.

Replace "Reserved" in section 19-3.03A with:

Where shown, remove material below the bottom of retaining wall footings. Replace with Class 2 aggregate base and place and compact as specified for structure backfill in section 19-3.03E. Relative compaction must be at least 95 percent.

Rock may exist within the limits shown; if rock is encountered, upon Engineer approval, further excavation may not be required. The Department does not adjust the unit price of an increase or a decrease in the overexcavation (retaining wall) quantity.

NOT FOR CONSTRUCTION

Add to section 19-3.04:

Class 2 aggregate base placed below footings is paid for as structure backfill.

Add to section 19-7.02C:

The portion of imported borrow placed within 4 feet of the finished grade must have a resistance (R-Value) of at least 21.

^^

20 LANDSCAPE

Add to section 20-2.01A(1) of the RSS for section 20:

Irrigation system installed must provide all parts required to adequately irrigate trees planted between stations 103+00 right and 105+50 right, including but not limited to, connection to the existing water main, water meter, PVC pipe, bubblers and point of connection.

Add to section 20-2.01A(3)(a) of the RSS for section 20:

Determine items and quantities required to complete work. Submit the quantities as part of the schedule of values.

Provide a schedule of values for each lump sum bid item.

Provide a recommended irrigation watering schedule including the number of days per week to water and the watering rates.

Add to section 20-2.07B(2)(a) of the RSS for section 20:

Before the irrigation system functional test begins, furnish 2 remote access devices.

Add to section 20-2.07B(3) of the RSS for section 20:

Add to section 20-3.01B(2)(a) of the RSS for section 20:

Pot plants for plant group A include all potted plants in five gallon containers.

Potted (container) plants must be grown in individual containers.

Do not use containers made of biodegradable material.

Delete the 1st row in the table in the 3rd paragraph in section 20-3.01B(2)(a) of the RSS for section 20

Add to section 20-3.03C(1) of the RSS for section 20:

Exact locations of plants to be as directed by the Engineer.

NOT FOR CONSTRUCTION

Add to section 20-5.03A(1)(a) of the RSS for section 20:

Where feasible use mulch from clearing and grubbing operations. Additional mulch may be imported as necessary.

Replace section 20-3.01B(4)(b) of the RSS for section 20 with:

Slow-release or controlled-release fertilizer must be a pelleted or granular form, must be slow-release or controlled-release with a nutrient release over a 2-year period, and must fall within the following guaranteed chemical analysis range:

Ingredient	Content (percent)
Nitrogen	20
Phosphoric acid	10
Water soluble potash	5

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 March and September of each year.

Add to section 20-4.03F of the RSS for section 20:

Trees will be planted from container grown stock of at least one-gallon size. Each tree will be tagged and numbered after planting to facilitate annual monitoring and to track the performance of individual plants.

Planting holes will be excavated to at least the depth of planting containers and three times the width. Shrubs cleared for construction could be chipped and used as mulch around tree plantings. Mulch should be placed over the root system. Mulch should not be placed against the trunk.

Planting must occur after September 15. Water the new plantings until contract acceptance.

^^

21 EROSION CONTROL

Replace section 21-1.02G with:

Measure and mix individual seed species in the presence of the Engineer before applying seed.

Seed must comply with the following:

Category	Botanical Name (Common Name)	Seed Percent Germination (Minimum)	Pounds Pure Live Seed Per Acre (Slope Measurement)
A	Bromus Carinatus (California Brome)	85	15
A	Elymus Glaucus (Blue Wildrye)	70	15

NOT FOR CONSTRUCTION

A	Festuca californica (Calfiornia Fescue)	70	15
A	Hordeum Brachyantherum Ssp. californicum (California Barley)	70	15
A	Nassella Pulchra (Valley Needlegrass)	70	15
A	Poa secunda (Pine Bluegrass)	70	15
B	Lupnius bicolor (Minature lupine)	70	10
B	Lupinus Succulentus (Arroyo Lupine)	70	10
B	Trifolium albopurpureum (any subspecies) (Rancheria clover)	90	10
B	Trifolium microcephalum (small-head clover)	90	10
B	Trifolium willdenovii (Tomcat clover)	90	10
C	Clarkia purpurea (Clarkia)	70	5
C	Eschscholzia California (California Poppy)	80	5
		Total	150.0

The seed mixture shall consist of at least two species from Category A (grasses) and at least four species from Category B (legumes) and one from Category C (wildflowers). These species shall be selected from the table above.

Replace the last sentence of the 1st paragraph in section 21-1.03E with:

Seed may be dry applied to small areas not accessible by hydroseeding equipment.

Add the following table to the 4th paragraph in section 21-1.03E:

Material	Pounds Per Acre (Slope Measurement)
Seed	75
Fiber	2,000
Organic Fertilizer	500

^^

DIVISION V SURFACINGS AND PAVEMENTS

39 HOT MIX ASPHALT

NOT FOR CONSTRUCTION

Add to section 39-1.01A:

Temporary hot mix asphalt must comply with section 5-1.36A and the Contract for permanent hot mix asphalt (Type B).

Produce and place HMA Type B under the Standard construction process.

Add to section 39-1.02C:

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

Add to section 39-1.02E:

Aggregate used in HMA Type B must comply with the 3/4-inch HMA Types A and B gradation, except for in miscellaneous areas. Aggregate used in miscellaneous areas must comply with 1/2-inch gradation.

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.

^^

DIVISION VI STRUCTURES

47 EARTH RETAINING SYSTEMS

Replace "Reserved" in section 47-4 with:

47-4 MODULAR BLOCK WALL

47-4.01 GENERAL

47-4.01A Summary

Section 47-4 includes specifications for constructing Modular Block Walls.

Geogrid reinforcement must comply with section 88.

Earthwork must comply with section 19, except for payment.

The alternative earth retaining system must be one of the systems shown in the following table:

NOT FOR CONSTRUCTION

Proprietary earth retaining system	Web site/e-mail	Address	Telephone no.
Landmark Reinforced Soil Wall System	dsandri@anchorwall.com	ANCHOR WALL SYSTEMS INC 2525 COSTERO MAGESTUOSO SAN CLEMENTE CA 92673-6424	(949) 363-6663
KeySystem 1	http://www.keystonewalls.com	KEYSTONE RETAINING WALL SYSTEMS 4444 W 78TH ST MINNEAPOLIS MN 55435-5406	(952) 897-1040
Mesa Retaining Wall System	http://www.tensarcorp.com	TENSAR INTERNATIONAL CORPORATION 2500 NORTHWIND PKWY STE 500 ALPHARETTA GA 30009-2247	(770) 344-2000

47-4.01B Definitions

Not Used.

47-4.01C Submittals

Submit shop drawings for the modular block wall.

Include the following:

1. All information required for construction of the system at each location
2. Existing ground line at the wall face
3. Design parameters, material notes, and wall construction procedures

Verify existing ground elevations before submitting drawings.

Shop drawings and calculations must be sealed and signed by an engineer who is registered as a civil engineer in the State.

Allow 30 days for the Department's review.

47-4.02 MATERIALS

Reserved.

47-4.03 CONSTRUCTION

Construction must comply with manufacturer's recommendations.

Construct the wall to the lines and grades shown. Check vertical and horizontal alignment at each course during erection.

The top of wall profile must conform to the profile shown. The bottom of wall elevations must be at or below the minimum embedment depth recommended by the manufacturer. Use a minimum height and length of wall adequate for the specified loading and site conditions.

Existing and proposed utilities may conflict with placement of geogrid. Exclusion zones are shown where excavation for geogrid may be restricted. Provide calculations and manufacturer recommendations for accommodating utilities and storm drain infrastructure as shown.

NOT FOR CONSTRUCTION

47-4.04 PAYMENT

Payment for excavation, backfill, geogrid and drainage system is included in the payment for the modular block wall.

^^

50 PRESTRESSING CONCRETE

Replace the 2nd paragraph of section 50-1.01C(3) with:

For initial review, submit:

1. 6 copies

^^

51 CONCRETE STRUCTURES

Add to section 51-1.01C(1):

If the methacrylate crack treatment is performed within 100 feet of a residence, business, or public space, submit a public safety plan that includes the following:

1. Public notification letter with a list of delivery and posting addresses. The letter must describe the work to be performed and state the treatment work locations, dates, and times. Deliver the letter to residences and businesses within 100 feet of overlay work and to local fire and police officials not less than 7 days before starting overlay activities. Post the letter at the job site.
2. Airborne emissions monitoring plan. A CIH certified in comprehensive practice by the American Board of Industrial Hygiene must prepare and execute the plan. The plan must have at least 4 monitoring points including the mixing point, application point, and point of nearest public contact. Monitor airborne emissions during overlay activities.
3. Action plan for protecting the public if levels of airborne emissions exceed permissible levels.
4. Copy of the CIH's certification.

After completing methacrylate crack treatment activities, submit results from monitoring production airborne emissions as an informational submittal.

Add to section 51-1.02B:

For the portions of structures shown in the following table, concrete must contain at least 675 pounds of cementitious material per cubic yard:

Bridge name and no. or Retaining Wall no.	Portion of structure
Hangtown Creek Bridge	Concrete slab
Retaining wall No. 1	Wall
Retaining wall No. 3	Wall

Air entrainment must be 6 ± 1.5 percent for concrete with a compressive strength greater than 4,500 psi.

NOT FOR CONSTRUCTION

Add to section 51-1.03G(1):

Architectural textures listed below are required at concrete surfaces shown on the plans:

1. Custom Rock International Rough Cut Cedar #SP152 on all sides of the top beam of the bridge rail. Prepare and stain all surfaces receiving the texture under section 59-7.02.

The architectural texture must be a formed relief constructed as shown. The architectural texture must be placed beyond the structural section member and minimum structural dimensions, and reinforcement clearances must be maintained. Corners at the intersection of plane surfaces must be sharp and crisp without easing or rounding. A Class 1 surface finish must be applied to the architectural texture.

Test panel is required under section 51-1.01D(3).

Add section 51-1.03G(3):

51-1.03G(3) Thin Brick Veneer

Apply Ledgestone veneer to concrete surfaces with a mortar bond coat as shown.

51-1.03G(3)(a) Materials

Coloring of the veneer must be similar to El Dorado Stone "Alderwood Stacked Stone".

Mortar will be a proprietary, premixed packaged blend of cement, lime, and sand, without color, that requires only water to prepare for use. Packages of premix must have the manufacturer's name, brand, weight, and color identification. The manufacturer's recommended mixing proportions and procedures must be furnished to the Engineer.

Grout must be suitable for grouting quarry tile and conform to ANSI Standard: A 108.5 and must consist, by volume, of

1. one part portland cement,
2. up to 1/5 part lime,
3. 2 parts sand,
4. and an amount of water to provide a grout with a consistency that can be forcibly compressed into joints.

As an alternative, a proprietary portland cement grout suitable for grouting quarry tile may be used.

51-1.03G(3)(b) Preparing Surfaces

Surfaces of concrete receiving the ledgestone veneer must be abrasive blasted to remove foreign substances, such as paint, tar, oil, and curing compounds, and to partially expose air bubbles and provide a roughened sandy texture.

51-1.03G(3)(c) Bond Coat

The bond coat must be either dry set mortar or latex-portland cement mortar. Organic adhesive will not be used for bond coat. The consistency of the mixture must result in ridges formed with the recommended notched trowel that do not flow or slump. Reworking will be allowed provided no water or materials are added. The cured setting bed must be dampened before placing the bond coat, but the setting bed must not be soaked.

The bond coat must be floated onto the cured setting bed surface with sufficient pressure to cover the surface evenly with no bare spots. The surface area to be covered with bond coat must not exceed the area that can be covered with ledgestone veneer while the bond coat is still plastic. Bond coat must be combed with a notched trowel within 10 minutes before installing ledgestone veneer. Ledgestone veneer must not be installed on a skinned over mortar bond coat.

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51-1.03G(3)(d) Laying Veneer

Ledgestone veneer must be thoroughly wetted before laying. The wetted ledgestone veneer must be drained adequately to prevent floating of the ledgestone veneer on the mortar bed. Sprinkling the water onto ledgestone veneer is not an acceptable method for wetting.

The ledgestone veneer units must be dry fitted before installation to minimize joint size and then back buttered immediately before installing the units and must be firmly pressed into the freshly notched bond coat. Ledgestone veneer units must be tapped to a true surface and obtain 100 percent coverage by mortar on the back of each unit. Joints must be tight resulting in a dry stack appearance.

Bond coat mortar that exudes into the grout spaces between and around ledgestoneveneer units must be removed to the bottom of the unit.

Spacers, strings, ropes, pegs, glue, paper, and face mounting material must be removed before grouting the veneer Grouting must not begin until at least 48 hours after installing veneer.

A maximum amount of grout must be forced into the joints between and surrounding veneer units. The grout must be tooled to a natural finish.

Cure the ledgestone veneer by keeping the veneer continuously damp for at least 72 hours after laying. Curing materials must not stain the veneer, mortared joints, or surrounding concrete surfaces.

Protect surfaces of completed masonry, concrete, and other such materials exposed to view from

1. spillage,
2. splatters,
3. and other deposits of cementitious materials.

Remove all deposits without damaging the materials or exposed surfaces. Stains, efflorescence, laitance, splashes, or spots on the faces of masonry exposed to view shall be removed. Cleaning agents must comply with the ledgestone veneer manufacturer's recommendations. Abrasive blast cleaning methods will not be permitted on surfaces of veneer.

Add to section 51-1.04:

Payment for utility box and utility conduit connections for future utilities at retaining wall #3 is included in the payment for structural concrete, retaining wall.

^^

54 WATERPROOFING

Replace "Not Used" in section 54-2.04 with:

Dampproofing is paid for as asphalt membrane waterproofing.

^^

^^

59 PAINTING

Add to section 59-7.02A(1):

A low viscosity, semi-opaque 100% acrylic emulsion penetrable to concrete must be used for the pigmented stain. The final color of stain must have written approval before batching using on the project.

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For each separate color and surface texture, provide a test panel and orientate it to be shade-free throughout the afternoon and so the vertical stained face is exposed to the southeast.

All surfaces to receive color stain must receive adequate surface preparation as specified by the stain manufacturer and the Engineer.

Use the following colors for the first set of test panels. A second set of test panels may be required if the Engineer does not approve the colors.

On the Rough Cut Cedar texture, barrier transitions and curb, use Dunn Edwards' "Cave of the Winds 6240" (dark brown).

Add to section 59-7.02D

Prepare and stain concrete barrier is included in the payment for the architectural treatment.

^^^

Add to section 73-3.04:

Payment for dowels is included in the payment for minor concrete (sidewalk).

Replace section 73-5 with:

73-5 PARKING BUMPERS

73-5.01 GENERAL

Section 73-5 includes specifications for installing parking bumpers.

73-5.02 MATERIALS

Each parking bumper must be a commercially-available precast-concrete unit.

The parking bumper must be of the dimensions shownigh with both top longitudinal corners continuously chamfered, and anchor holes located 9 inches from each end. Minor variations in cross-sectional dimensions are acceptable.

Anchor dowels must be bar reinforcement steel, commercially available, and of the dimensions shown.

73-5.03 CONSTRUCTION

Coordinate the arrangement of parking bumpers with the layout of parking stalls and traffic aisles, as shown.

Install dowels such that the tops of the bars are flush with the top of the parking bumper.

73-5.04 PAYMENT

Not used

^^

75 MISCELLANEOUS METAL

Add to the list in the 2nd paragraph of section 75-1.03A:

6. Utility pipe bracket, including plates, anchor bolts and galvanized U-bolt

^^

78 WATERLINE AND SEWERLINE WORK

78-1 GENERAL

All specifications in this section apply to the waterline and sewerline work only. This section does not apply to any other work on the project.

78-1 STRUCTURE EXCAVATION AND BACKFILL

78-1.01 GENERAL

This section shall govern the work for structure excavation and backfill. Structure excavation shall consist of the removal of material for the construction of foundations for vaults, manholes, or other structures, and

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other excavation designated on the Plans or in the Specifications as structure excavation. Trenching and backfill shall be in accordance with Section 78-2.

Structure excavation and structure backfill shall include the furnishing of all materials and equipment; the construction or installation of all facilities which may be necessary to perform the excavations and to place and compact the backfill; and the subsequent removal of such facilities, except where they are required or permitted by the Plans or Specifications to remain in place.

Submittals - Upon request, the following items shall be submitted and approved by the District.

A. Test results showing gradation, durability and sand equivalent of import material.
B. Permit and notification form for excavations 5 feet or more in depth as required by Cal-OSHA, including any trench excavation or shoring plans.

78-1.02 MATERIALS

Excavation - Excavation is unclassified. The Contractor shall complete all excavations regardless of the type of materials encountered. The Contractor shall make his own estimate of the kind and extent of the various materials which will be encountered in the excavation.

Backfill - Native earth backfill and imported backfill material shall conform to the requirements of Section 78-2.

78-1.03 CONSTRUCTION

Pavement - Bituminous or concrete pavements regardless of their thickness, and curbs and sidewalks shall be cut prior to excavation for the structure in accordance with the requirements of the encroachment permit or the District.

Pavement and concrete materials shall be removed from the site. These materials may be used as backfill if approved by the District.

Excavation - The sides of excavations for structures shall be sufficient to leave at least 1.5 feet clear as measured from the extreme outside of form work on the structure as the case may be. Where excavation is inadvertently carried below designated elevations, suitable provision shall be made at the expense of the Contractor for adjustment of construction, as directed by the Engineer to meet requirements incurred by the deeper excavation. No earth backfill will be permitted to correct overdepth excavation beneath structures, and overdepth excavation in such locations shall be rectified by backfilling with sand, graded gravel, or concrete as directed by the District.

Bracing - The Contractor's design and installation of bracing and sheeting shall take the necessary precautions to be consistent with the rules, orders, and regulations of the State of California Construction Safety Orders.

Excavations shall be so braced, sheeted, and supported that they will be safe, such that the walls of the excavation will not slide or settle and all existing improvements of any kind, either on public or private property, will be fully protected from damage.

The sheeting, shoring, and bracing shall be arranged so as not to place any stress on portions of the completed work.

The Contractor shall carefully remove sheeting, shoring, bracing, and timbering to prevent the caving or collapse of the excavation faces being supported.

Dewatering - The Contractor shall provide and maintain means and devices to continuously remove and dispose of all water entering the excavation during construction of the structure and during backfill operations.

Water shall be disposed of in a manner that will prevent damage to adjacent property and pipe trenches.

The Contractor shall not allow water to rise in the excavation until backfilling around and above the structure is completed.

Backfill - After structures and foundations are in place, backfill shall be placed to the original groundline or to the limits designated on the plans.

No material shall be deposited against cast in place concrete structures until the concrete has reached a compressive strength of at least 2,500 pounds per square inch.

Backfill material shall be placed in horizontal layers not exceeding 8 inches in depth.

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Compaction - Compaction requirements shall be as follows:

A. Backfill within 5 feet of structure: 95% relative compaction.
B. Structural Backfill beyond 5 feet of structure: 90 % relative compaction.
C. Gravel Base: 95% relative compaction.

Each layer of backfill material shall be moistened and thoroughly tamped, rolled, or otherwise compacted to the specified relative density.

Compaction equipment shall be carefully operated near structures to prevent their displacement or damage. Structural fill is to be placed and compacted in uniform layers around all sides of the structure.

Excess Excavated Material - The Contractor shall make the necessary arrangements for, and shall remove and dispose of all excess excavated material.

All surplus material shall become the property of and be disposed of offsite by the Contractor.

No excavated material shall be deposited on private property unless written permission from the owner thereof is secured by the Contractor. Before the District will accept the work as being completed, the Contractor shall file a written release signed by all property owners with whom he has entered into agreements for disposal of excess excavated material absolving the District from any liability connected therewith.

Restoration of Damaged Surfaces and Property - If any existing improvements, facilities, or vegetation not designated to be removed have been damaged, removed, or disturbed by the Contractor, for whatever reason, such improvements, facilities and vegetation shall be replaced or repaired at the expense of the Contractor.

Final Clean-up - After backfill has been completed, the right-of-way shall be dressed smooth and left in a neat and presentable condition to the satisfaction of the District.

78-2 TRENCH EXCAVATION, BACKFILL AND COMPACTION

78-2.01 GENERAL

This section governs the work for trench excavation, backfill and compaction for underground pipeline work.

Submittals - Upon request, the following items shall be submitted and approved by the District.

A. Test results showing gradation, durability and sand equivalent of pipe zone material.

B. Permit and notification form for excavations 5 feet or more in depth as required by Cal-OSHA, including any trench excavation or shoring plans.

Testing - Testing frequency and location shall be approved by the District.

78-2.02 MATERIALS

Trench Excavation ---- Excavation is unclassified. The Contractor shall complete all excavations regardless of the type of materials encountered. The Contractor shall make his own estimate of the kind and extent of the various materials which will be encountered in the excavation.

Pipe Zone ---- Material for the pipe zone shall conform to one of the following:

A. Sand/Decomposed Granite ---- Sand shall be free from organic matter, clay, debris, or any other material that, in the opinion of the Engineer, is objectionable or deleterious. Sand shall not have more than 13 percent passing a 200-mesh screen. Minor amounts of gravel up to 1 /2 inch in size will be permitted. The sand equivalent shall not be less than 30 and a durability index of not less than 35.

B. Aggregate Base ---- Base shall be 3/4 inch and minus or ½ inch and minus. The aggregate size gradation shall comply with Caltrans Specifications for Class 2 road base. The sand equivalent shall be 30 minimum. The durability index shall be 35 minimum.

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C. Plug and Drain Material ---- When a plug and drain system has been approved by EID and the County DOT, pipe zone material shall be Caltrans Standard permeable material designed for the specific condition.

Backfill - Material for backfill from 12 inches above the top of the pipe to subgrade, shall be free from organic matter, debris, and rocks larger than 6 inches in diameter or length. The District shall be the sole judge of conformance of backfill material to this specification.

Backfill material shall generally conform to the following gradation:

Sieve Size	Percent Passing
6"	100
3"	50
#4	35-100
#30	20-100

78-2.03 CONSTRUCTION

Excavation - Excavation for pipelines, fittings, and appurtenances shall be open trench to the depth and in the direction necessary for the proper installation of the same as shown on the contract drawings or as otherwise approved by the Engineer. Excavation shall only proceed when the necessary materials have been delivered to the site.

The Contractor shall bear all costs of disposing of roots and all other waste materials from the excavation. Material shall be disposed of in such a manner as to meet all requirements of the state, county, and local regulations regarding health, safety, and public welfare. Non-flammable material and flammable material, when burning is not permitted, shall be disposed of off the construction site in an approved location at the Contractor's expense.

The Contractor shall remove obstructions within the trench area or adjacent thereto, such as abandoned concrete structures, logs, and debris of all types, without additional compensation. The Engineer may, if requested, make changes in the trench alignment to avoid major obstructions, if such alignment can be made without adversely affecting the intended function of the facility.

A. Existing Pavement Removal - Pavement to be removed shall be removed and replaced in the manner prescribed by the Agency issuing the encroachment permit.

   Existing pavement, curbs, gutters, sidewalks and driveways to be removed in connection with construction shall be neatly saw cut prior to removal. Saw cuts shall have a minimum depth of one inch in concrete sidewalk.

   Concrete sidewalks or driveways shall be removed so that a minimum 30-inch square is replaced. If the saw cut in a sidewalk or driveway would fall within 30 inches of a construction joint, expansion joint, or edge, the concrete shall be removed and replaced to the joint or edge. If the saw cut would fall within 12 inches of a score mark, the concrete shall be removed and replaced to the score mark. Concrete shall be removed by jackhammer.

B. Grading and Stockpiling - The Contractor shall control grading in a manner to prevent water running into excavations. Obstructions of surface drainage shall be avoided and means shall be provided whereby storm and wastewater can be uninterrupted in existing gutters, other surface drains or temporary drains. Material for backfill or for protection of excavation in public roads from surface drainage shall be neatly placed and kept shaped so as to cause the least possible interference with public travel. Free access must be provided to all fire hydrants, water valves, meters and private drives.

C. Line and Grade - The Contractor shall excavate the trench to the lines and grades shown on the plans. Any deviations shall first be approved by the Engineer.

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The trench shall be excavated to a minimum depth of 6 inches below the bottom of the pipe. The sides of the trench shall be excavated and maintained as nearly vertical as is practical.

D. Trench Support - The trench shall be adequately supported and the safety of workers provided for as required by the standard of the appropriate regulatory agency.

All shoring for open excavations shall conform to the State of California, Department of Industrial Relations, Division of Industrial Safety "Construction Safety Orders."

The Contractor shall be responsible for adequately shored and braced excavations so that the earth will not slide, move or settle, and so that all existing improvements of any kind will be fully protected from damage.

No shoring once installed, shall be removed until the trench has been approved for backfill operations. Removal of shoring shall only be accomplished during backfill operations and in such a manner as to prevent any movement of the ground or damage to the pipe or other structures.

The Contractor shall obtain all permits for any excavations over five feet in depth into which a person is required to descend or any excavation less than five feet in depth in soils where hazardous ground movement may be expected and into which a person is required to descend.

Excavated material shall not be placed closer than two feet from the top edge of the trench. Heavy equipment should not be used or placed near the sides of the trench unless the trench is adequately braced.

E. Use of Explosives - Blasting for excavation will be permitted only after securing the approval of the Engineer and only when precautions are taken to eliminate danger to life or property. Explosives are to be stored in accordance with the provisions of DIVISION XI of the Health and Safety Code of the State of California. The Contractor is responsible to secure any required permits for use and storage of explosives. The Contractor shall notify the proper representatives of any public service corporation, or any individual at least 24 hours in advance of any blasting which may damage his or their property, along or adjacent to the construction zone.

Blasting mats shall be used at all times where flying rock might cause damage to any person, building, power line or other installation.

All traffic shall be stopped a safe distance from the blasting operation and all persons shall be removed from the area prior to blasting.

The Contractor shall designate, in writing, a single responsible individual as the Powder Foreman. Carelessness or incompetency by the Powder Foreman shall be grounds for immediate removal from said position or responsibility and the Powder Foreman shall not be permitted to handle or use explosives on the remainder of the project. Priming of all explosives shall be with electric detonators of sufficient size to ensure efficient and complete detonation of the explosive charge. All charges consisting of more than one hole shall be wired either as series or series-parallel. Straight parallel hookups will not be permitted.

The Contractor is responsible to provide a power source adequate for detonation of the explosive charges consistent with the accepted standard practices involving electric detonation of explosives. Excessive blasting will not be permitted and any material outside the authorized cross section which may be loosened or shattered by blasting, shall be removed.

The Engineer shall have authority to require the Contractor to discontinue any method of blasting which leads to overshooting, is dangerous to the public, or is destructive to property or natural features.

The Contractor shall notify the District a minimum of two hours in advance of any blasting operations.

F. Preservation of Trees - Excavation within the dripline of any tree shall conform to the following and to encroachment permits. Trees shall not be removed outside of fill or excavated areas, except as authorized by the District.

Tree roots larger than 2 inches in diameter shall not be cut and shall be kept moist during exposure. For damaged or severed root systems, trees shall be trimmed to compensate for the decreased root system. Trimming shall be done to the satisfaction of the Inspector. All roots shall be neatly cut with saw or sharp cutter.

G. Dewatering - The Contractor shall provide and maintain, at all times during construction, ample means and devices with which to promptly remove and properly dispose of all water from any source entering the excavations or other parts of the work. Dewatering shall be accomplished by methods which will ensure a dry excavation and preservation of the final lines and grades of the bottoms of excavations. Said methods may include well points, sump pumps, suitable rock or

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gravel placed below the required bedding for drainage and pumping purposes, temporary pipelines and other means, all subject to the approval of the Engineer.

Dewatering for the structures and pipelines shall commence when groundwater is first encountered and shall continue until the backfill at the pipe zone has been completed.

The Contractor shall dispose of the water from the work in a suitable manner without damage to adjacent property. No water shall be drained into work built or under, construction without prior consent of the Engineer. Water shall be disposed in such a manner as not to be a menace to public health.

The Contractor shall be responsible to obtain all required Local and State Permits .

H. Correction of Faulty Grades - Any over-excavation carried below the grade as specified or shown, shall be rectified by backfilling with approved sand and/or graded gravel, and shall be compacted to provide a firm and unyielding subgrade and/or foundation, as directed by the Engineer.

I. Structure Protection - Temporary support, adequate protection and maintenance of all underground and surface structures, drains, sewers and other obstructions encountered in the progress of the work shall be furnished by the Contractor at his expense and subject to the approval of the Engineer. Any structure that has been disturbed shall be restored upon completion of the work.

J. Protection of Property and Surface Structures - Trees, shrubbery, fences, poles and all other property and surface structures shall be protected unless their removal is shown on the drawings or authorized by the Engineer.

K. Trench Width and Grade - The width of the trench within the pipe zone shall be such that the clear space between the barrel of the pipe and the trench wall shall not exceed the amount shown in the standard details. In general, the following shall be adhered to:

Nominal Pipe Diameter	Trench Width Minimum	Maximum
6"-12"	O.D. + 12"	O.D. + 18"
14"-18"	O.D. + 18"	O.D. + 24"

Trench widths in excess of those specified must have prior written approval.

L. Maximum Length of Open Trench - Unless otherwise specified or directed by the District, the maximum length of open trench shall be 500 feet, or the distance necessary to accommodate the amount of pipe installed in a single day, whichever is greater. The distance is the collective length of any location, including open excavation, pipe laying and appurtenant construction and backfill which has not been temporarily resurfaced. Failure by the Contractor to comply with the limitations specified herein may result in an order to halt progress of the work until compliance has been achieved. The Contractor shall provide proper barricades for excavated areas.

Trench Foundation - The trench bottom shall be graded to provide a smooth, firm and stable foundation at every point throughout the length of the pipe. Should large gravel and cobbles be encountered at the trench bottom or pipe subgrade, they shall be removed from beneath the pipe and replaced with clean imported sand which shall be compacted to provide uniform support and a firm foundation.

A. Foundations in Poor Soil - If excessively wet, soft, spongy, unstable or similarly unsuitable material is encountered at the surface upon which the bedding material is to be placed, the unsuitable material shall be removed to a depth as determined in the field by the Engineer. The Contractor's attention is called to Section 3.1G, regarding his responsibilities in maintaining adequate dewatering procedures to ensure that an otherwise stable foundation will not be rendered unfit due to accumulation of water.

Backfill and Compaction - Backfill shall be completed within the shortest possible time so that the construction area or street can be opened to traffic. If for any reason construction of the pipeline or appurtenances thereto is delayed, the District may require that the trench be backfilled and such areas or streets opened to traffic.

A. Pipe Zone· - After completion of the trench excavation and proper preparation of the foundation, 6 inches of bedding material shall be placed on the trench bottom for support under the pipe. Bell

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holes shall be dug to provide adequate clearance between the pipe bell and the bedding material. All pipe shall be installed in such a manner as to insure full support of the pipe barrel over its entire length. After the pipe is adjusted for line and grade and the joint is made, the remainder of the pipe bedding shall be placed to the limits as shown on the Drawings. All bedding material shall be compacted 90 percent as measured by Test Method California 231, prior to placement of subsequent backfill.

When bedding material is selected material or imported sand, the pipe bedding backfill shall be brought to optimum moisture content and shall be placed by hand in layers not exceeding 3 inches in thickness to the centerline (springline) of the pipe and each layer shall be solidly tamped with the proper tools so as not to injure, damage, or disturb the pipe. Backfilling shall be carried on simultaneously on each side of the pipe to assure proper protection of the pipe.

Each lift shall be "walked in" and supplemented by slicing with a shovel to ensure that all voids around the pipe have been completely filled. Mechanical compaction such as "pogo sticks" or "wackers", as approved, shall be used for compaction of pipe zone.

B. Initial Backfill - The remaining portion of the trench shall be backfilled, compacted and/or consolidated by approved methods to obtain a 90% compaction as measured by Test Method 231F. Backfill shall be good sound earth, sand or gravel. Bituminous pavement, concrete, rock, or other lumpy material shall not be used in the backfill unless these materials are scattered and do not exceed 6 inches in any dimension and are not placed within 1-1/2 feet of the surface. Material of perishable, organic matter, spongy or otherwise improper nature, shall not be used.

When backfill is placed mechanically, the backfill material shall be pushed onto the slope of the backfill previously placed and allowed to slide down into the trench. The Contractor shall not push backfill into the trench in such a way as to permit free fall of the material until at least 18 inches of cover is provided over the top of the pipe. Under no circumstances shall sharp, heavy pieces of materials be allowed to be dropped directly onto the pipe or the tamped material around the pipe. Backfill shall be placed in layers not exceeding 8 inches and compacted by an approved method.

Heavy duty compacting equipment having an overall weight in excess of 125 pounds shall not be used until backfill has been completed to a depth of 2 feet over the top of the pipe.

If hydro-hammer is used for compaction of overlying materials, at least 4 feet of backfill must be placed over the top of pipe prior to its use. This is required to insure that the pipe is not damaged.

C. Final Backfill - Final backfill placed in trenches below roadways or below shoulders of roadways, shall be compacted to a density of not less than 95% or as directed by the encroachment permit. Backfill outside of roadways shall be compacted to 90%.

Backfill shall be placed in layers not exceeding 8 inches, compacted and brought up to the subgrade of the roadway.

Excess Excavated Material - The Contractor shall make the necessary arrangements for, and shall remove and dispose of all excess excavated material. It is the intent of these specifications that all surplus material not required for backfill or fill shall be disposed of by the Contractor outside the limits of the public right-of-way and/or easements at no liability to the District.

No excavated material shall be deposited on private property unless written permission from the owner thereof is secured by the Contractor. Before the District will accept the work as being completed, the Contractor shall file a written release signed by all property owners with whom he has entered into agreements for disposal of excess excavated material absolving the District from any liability connected therewith.

Restoration of Damaged Surfaces and Property - If any pavement, trees, shrubbery, fences, poles or other property and surface structures have been damaged, removed, or disturbed by the Contractor, whether deliberately or through failure to carry out the requirements of the contract documents, state laws, municipal ordinances, or the specific direction of the District, or through failure to employ usual and reasonable safeguards, such property and surface structures shall be replaced or repaired at the expense of the Contractor.

Final Clean-Up - After backfill has been completed, the right-of-way shall be dressed smooth and left in a neat and presentable condition to the satisfaction of the District.

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78-3 MANHOLES

78-3.01 GENERAL

The work covered by this section shall consist of furnishing all materials, accessories, equipment, tools, transportation, service, labor and performing all operations to furnish and install concrete manholes in accordance with this section of the specifications and applicable drawings. Testing of manholes shall be done in accordance with Section 78-13.

Precast concrete bases, wall sections, and covers shall be manufactured in a facility especially designed for that purpose and shall conform to the shapes and dimensions indicated on the plans.

Submittals - Prior to installation, the following information is to be submitted:

A. Manufacturer's catalog data on precast items. Show dimensions, reinforcing thickness of walls, and top slab shall be shown. Show materials of construction by ASTM reference and grade.

B. Concrete mix design and reinforcing for cast-in-place concrete item.

Design Loads - Design loads shall consist of dead load, live load, impact, and, in addition, loads due to water table and any other loads which may be imposed upon the manhole.

78-3.02 MATERIALS

Concrete - Portland cement concrete shall conform to Class A as specified in the Caltrans Standard Specifications Section 90, "Portland Cement Concrete."

Reinforcement - Reinforcement shall be deformed reinforcement in accordance with ASTM A615 or ASTM A497 for welded deformed wire fabric.

Class 2 aggregate base shall be 3/4-inch aggregate base conforming to Caltrans Specifications for Class 2 aggregate base.

Precast Manhole Wall Sections - Precast manhole sections shall be of the size indicated on the Drawings. The Contractor shall provide the District with a Certificate of Compliance from the manhole manufacturer that the manholes and concrete mix conform in all respects to these specifications and requirements of ASTM C478. Minimum wall thickness shall be 4 inches. Cones shall have the same wall thickness and reinforcement as manhole section. The top and bottom of all sections shall be parallel.

Joints shall be tongue-and-groove type.

Precast Base Sections and Adaptor Ring - Unless otherwise approved, all concrete manhole bases shall be precast. Connections to the base shall be made with elastomeric boots or an approved cast-in adaptor.

Manhole Extensions - Concrete grade rings for extensions shall be a maximum of 6 inches high and shall be approved by the District before installation.

Mortar - Standard premixed mortar conforming to ASTM C387 or proportion 1 part portland cement with 2 parts clean, well graded sand which will pass a 1/8-inch screen. Admixtures may be used provided they do not exceed the following percentages by weight of cement: Hydrated lime, 10 percent; diatomaceous earth or other inert materials, 5 percent. Consistency of mortar shall be such that it will readily adhere to the applied surface. Mortar mixed for longer than 30 minutes shall not be used.

Preformed Plastic Gaskets - Preformed plastic gaskets shall be used for the manhole assembly and shall be Kent-Seal No. 2 manufactured by Hamilton Kent Manufacturing Company, Box 178, Kent, OH 44240; Ram-Nek, manufactured by K.T. Snyder Company, Inc., Central National Bank Bldg., Houston, TX 77002; or equal, meeting all requirements of Federal Specifications SS-S00210.

Manhole Frames and Covers - Covers shall have the word SEWER in raised 2-inch letters. Castings shall be tough, close-grained gray iron, sound, smooth, clean free from blisters, blowholes, shrinkage, cold shuts, and all defects, and shall conform to ASTM A48, Class 30B. All bearing surfaces shall be

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machined to ensure true flat surfaces. Covers shall be true and seat within the ring at all points. Frames shall be water tight and be of the grooved gasketed type. Manhole frames and covers shall be as shown on the approved Materials List.

Backfill Material - Backfill material shall conform to Section 78-1. When material from the excavation is unsuitable for use in backfill, it shall be disposed of and suitable material, which is capable of attaining the required relative compaction, shall be arranged for and furnished.

78-3.03 CONSTRUCTION

Excavation - The Contractor shall prepare an excavation large enough to accommodate the structure and permit grouting of openings and backfilling operations. Excavations shall be made in accordance to Section 78-1. No earth backfill will be permitted to correct over-depth excavation. Over excavation shall be corrected as described in Section 78-1.

Precast Bases - Precast bases shall be placed on 6 inches of pipe bedding material compacted to 95% and graded level. The top of the base, when installed, shall be level in all directions.

Cast-in Place Bases - Manhole base shall be poured in accordance to the standard drawing against undisturbed soil. All vertical surfaces shall be poured against approved forms. The base shall extend to the lines shown on the details.

The manhole stubs and sewer main shall be set before the concrete is placed and shall be rechecked for alignment and grade before the concrete has set. The various sized inlets and outlets to the manhole shall be located as indicated on the plans and as detailed in the detail drawings. Invert elevations of connecting sewers may vary.

The invert of the manhole base shall be hand worked so as to provide channels conforming in size and shape to the lower portions of the inlets and outlets. The manhole invert channels shall be smooth and accurately shaped. Channels may be formed directly in the concrete base.

All transitions shall be smooth and of the proper radius to give an uninterrupted transition of flow.

The concrete base shall be shaped with a wood float and shall receive a hard steel trowel finish before the concrete sets.

In the event additional mortar is required after initial set has taken place, the surface to receive the mortar shall be primed, and the mortar mixed with a Concrete Adhesive in the amounts and proportions recommended by the manufacturer and as directed by the District in order to secure as chip-proof a result as possible.

The bases shall set a minimum of 24 hours before manhole construction is continued. In certain critical situations, the time of setting may be reduced upon approval of the District.

Manhole Assembly - Manhole assembly shall be as shown on the standard drawings. Each precast concrete unit shall be set plumb using preformed plastic gaskets at all joints.

It is the intent of these specifications that manholes and appurtenances be watertight and free from infiltrations. Manholes shall be free of any seeping or surface moisture prior to the application of a protective lining or coating. Adequate water tightness of manholes and appurtenances shall be determined by the District upon completion of testing by the Contractor. All stubs shall be plugged with stoppers or brick wall plugs as shown on the plans for various sizes of pipe.

In order to prevent accidental use of the new sewer before completion and acceptance, the inlet to existing tie-in manholes shall be sealed. Installation of these plugs shall be approved by the District. Plugs shall be removed at the time of final inspection or as directed by District.

New Connections to Existing Manholes - New connections to existing manholes, where stubs have not been provided, shall be made by core drilling through the wall and rebuilding the manhole bench as shown on the standard drawings.

Backfill - Backfill around manholes shall be placed and compacted in accordance to Section 78-1.

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78-4 DUCTILE IRON PIPE AND FITTINGS (PRESSURE FLOW) (UNDERGROUND)

78-4.01 GENERAL

This specification governs the furnishing and installation of ductile iron pipe material and main line fittings including laying, joining, bedding and approvals. All incidentals and appurtenant operations necessary for the construction of pipelines shall be accomplished in strict accordance with the drawings and other terms and conditions of the contract.

Fitting types covered under this section include bends, tees, crosses, reducers, couplings, caps, plugs, adapters and all other fittings necessary for a complete pipeline installation.

The Contractor shall also furnish all equipment, tools, labor and materials required to relocate sewers, conduits, ducts, pipes, or other structures as may be necessary to complete the installation as shown and specified .

All standard specifications, i.e., AWWA, ASTM, etc., made a portion of these specifications by reference shall be the latest edition and revision thereof

The Contractor shall be responsible for all material furnished by him, and shall replace at his own expense, all material found defective in manufacture or damaged in handling after delivery by the manufacturer. This shall include the furnishings of all material and labor required to replace defective material discovered prior to final acceptance of the work.

The Contractor shall be responsible for the safe storage of material until it has been incorporated into the completed project. The interior of all pipe and fittings shall be kept free from dirt and foreign matter at all times.

Pipe surfaces shall be free from nicks, scratches and other blemishes. The joining surfaces of pipe spigots and bell sockets shall be free from gouges or other imperfections that might cause leakage.

Submittals - Submittals shall be provided for the following items plus all additional items required in the specifications for the particular type of pipe:

- Pipe and joint material
- Fittings
- Specialties

78-4.02 MATERIALS

Ductile Iron Pipe (DI) - Ductile iron pipe shall conform to the quality and strength requirements of AWWA C-151.

A. Markings - Each standard or random length of pipe shall be clearly marked with the following:
   1. The letters "DI" or "Ductile"
   2. Nominal size and class
   3. Year produced
   4. Manufacturer's trade name and country where cast
   5. Seal (mark) of testing agency

B. Pressure Class - Where the class is not indicated on the plans, the pipe shall be Class 350.
C. Laying Length - Standard laying lengths of 18- or 20-foot are acceptable.
D. Joint Type - Unless otherwise shown or specified, pipe joints shall be rubber gasket push-on type joint conforming to AWWA C-111.
   1. Flanged Joint - Where flanged joints are specified, pipe barrel shall be threaded and fitted with flanges in accordance to AWWA C-115 "Flanged Ductile Iron Pipe with Threaded Flanges."

E. Physical Test Requirements - Hydrostatic, tension test, and impact test shall be conducted at the factory in accordance with ASTM A 746. All testing shall be performed by a recognized testing

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laboratory with such testing available for inspection by the District. If required, the manufacturer shall supply a letter of certification attesting to their pipe meeting these specifications.

F. Lining and Coating - The inside surfaces shall be cement mortar lined in accordance with ANSI/AWWA C-104/A21.4. The outside coating shall be an asphaltic coating per AWWA C-151.

G. Polyethylene Encasement - Pipe and fittings shall be wrapped in polyethylene. Polyethylene wrapping shall be in accordance to AWWA C-105, latest revision. Minimum thickness shall be 0.09s inch (8 mils).

H. Warning Tape - Two-inch-wide non-metallic tape marked "waterline."

Fittings - All cast and ductile iron fittings shall be manufactured in accordance with the following AWWA Standards: C-104, "Cement-Mortar Lining for Ductile-Iron Pipe and Gray-Iron and Fittings for Water", C-110, "Gray-Iron and Ductile-Iron Fittings, 3 inches through 48 inches for Water and Other Liquids", C-111, "Rubber- Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings," with the following additional requirements or exceptions. All fittings shall be furnished with a cement-mortar lining of standard thickness as defined in referenced specifications.

All fittings shall be rated equally to the class of pipe. End connections may be push- on, mechanical, or flanged joints.

Ductile iron compact fittings, per AWWA C-153, are allowed.

A. Flanges. Bolts and Gaskets - Flanges shall be flat-faced and meet either the requirements of AWWA C-207 for steel hub flange fittings, or AWWA C-110 Section 10-18 for ductile iron fittings. The flanges shall be marked with the size, name or trademark of manufacturer and with the AWWA Class; i.e., "E", or pressure rating.
Bolts and nuts shall be cadmium plated, A307, Grade B of domestic origin. Cadmium plating shall conform to Federal Specification QQ-P-415-1956, Type 1, Class 1.
Gaskets shall be 1/8-inch thick and be of the full-face self-centered cloth impregnated type. The following table shows the bolt pattern for ASME/ANSI 16.1 Class 125 cast iron flange. This pattern is rated at 275 psi for Class E steel pipe flanges and 250 psi for ductile iron pipe fittings.

Pipe Size	Bolt Hole Diameter (Inches)	Bolt Diameter & Length (Inches)	Number of Bolts
6"	7/8	3/4 x 3 1/2	8
8"	7/8	3/4 x 3 1/2	8
10"	1	7/8 x 4	12
12"	1	7/8 x 4	12
14"	11/2	1 x 4 1/2	12
16"	1 1/8	1 x 4 1/2	16
18"	1 ¼	1 1/8 x 5	16

The Contractor shall uniformly tighten the bolts and prevent bending or torsional strains. Proper anchorage shall be provided.

A. Mechanical Joint Fittings - The mechanical joints shall meet AWWA C111. That standard covers the joint as well as gaskets and bolts. T-bolts and nuts shall be manufactured of corrosion-resistant high-strength low-alloy Cor-Ten steel or equal. Number and length of bolts shall be as follows:

Pipe Size	Number of Bolts	Bolt Diameter & Length (inches)

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6"	6	3/4 x 3 1/2
8"	6	3/4 x 4
10"	8	3/4 x 4
12"	8	3/4 x 4
14"	10	3/4 x 4
16"	12	3/4 x 4 1/2
18"	12	3/4 x 4 1/2

A. Restrained Joints - Restrained joint pipe and fittings shall be U.S. Pipe TR FLEX or approved equal.
B. Coatings and Linings - Cast iron fittings shall be cement mortar lined per AWWA C-104 and receive a bituminous coating per AWWA C110.
Threaded holes and mating surfaces shall not be coated. Flanged faces shall be coated with asphaltic varnish only. There shall be no coating of materials, or mortar on gasket grooves.
C. Mechanical Couplings - Couplings include transition couplings, flanged coupling adapters, flexible and insulated couplings.
1. Coupling Sleeves and Flanges - Coupling sleeves and flanges may be of gray iron or carbon steel.
2. Bolts and Nuts for Flanges - Bolts and nuts for buried and submerged flanges, flanges in underground vaults and structures, and flanges located outdoors above ground shall be cadmium plated, A307, Grade B. Provide one washer for each nut. Each washer shall be of the same material as the nut.

78-4.03 CONSTRUCTION

Handling and Transportation - Handling and transportation of pipe shall be in accordance with the pipe manufacturer's published instructions.

Heavy canvas, or nylon slings of suitable strength shall be used for lifting and supporting materials. Chains or cables shall not be used.

Pipe and fittings shall not be stored on rocks or gravel, or other hard material which might damage the pipe.

A. Rubber Gasket Storage - All rubber gaskets shall be stored in a cool, well ventilated place and not exposed to the direct rays of the sun. Gaskets shall not be allowed in contact with oils, fuels, petroleum, or solvents.

Pipe Laying - Pipe shall be laid in accordance with the pipe manufacturer's published instructions, as complimented and modified herein.

A. Cleanliness - The interior of pipes shall be clean of foreign materials before sections of pipe are installed and shall be protected to prevent entry of foreign materials after installation.
Open ends of installed pipe shall be sealed with watertight plugs or other approved means at times when pipe installation is not in progress.
Ground water shall not be allowed to enter the pipe.
B. Inspection Before Installation - All pipe and fittings shall be carefully examined for cracks and other defects while suspended and before installation. Spigot ends shall be examined with particular care as this area is the most vulnerable to damage from handling. Defective pipe or fittings shall be laid aside for inspection by the District, who will prescribe corrective repairs or rejection.
C. Lowering of Pipe Material into Trench - Proper implements, tools, and equipment, satisfactory to the District, shall be provided and used by the Contractor for the safe and convenient performance of the work. All pipe, fittings, valves, and hydrants shall be carefully lowered into the trench piece by piece in such a manner as to prevent damage to the water main materials and protective coatings and linings. Under no circumstances shall water main materials be dropped or dumped into the trench.

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If damage occurs to any pipe, fittings, valves, hydrants or water main accessories in handling, the damage shall be immediately brought to the District's attention.

D. Laying of Pipe - Pipe shall be laid in trenches to the line and grade indicated on the plans and as specified.
Every precaution shall be taken to prevent foreign material from entering the pipe while it is being placed in the trench. If the pipe laying crew cannot install the pipe into the trench without getting earth into it, the District's
Inspector may require a heavy tightly woven canvas bag of suitable size, or plastic caps, be placed over each end of the pipe prior to installation and left there until the connection is made to the adjacent pipe. During laying operations, no debris, tools, clothing or other material shall be placed in the pipe.
As each length of pipe is placed in the trench, the spigot end shall be centered in the bell or coupling, and the pipe forced home and brought to correct line and grade. The pipe shall be secured in place with approved backfill material tamped under it, except at the bells or couplings. Precautions shall be taken to prevent dirt from entering the joint space.
Joints shall be assembled in accordance with the manufacturer's instructions. Each joint shall be checked with a feeler gauge to assure proper seating of the gasket.

E. Cutting of Pipe - Field cuts and connections shall be in accordance with the pipe manufacturer's published instructions.
The cutting of pipe for inserting valves, fittings, or closure pieces, shall be done in a neat and workmanlike manner without damage to the pipe so as to leave a smooth end at right angles to the axis of the pipe.

F. Allowable Deflection - The maximum allowable angular deflection at the joints shall be 80 percent of manufacturer's recommendation for push-on and mechanical joints.

Fittings - Fittings shall be installed in the manner specified herein.

A. Anchorage for Fittings - All fittings shall be provided with a thrust block constructed against undisturbed soil as shown on the Standard Drawings.

B. Trust Blocks - Thrust blocks shall be constructed of Class B concrete. Care shall be taken not to obstruct the outlets of tees or crosses, which are intended for future connections. A waterproof paper or plastic bond-beaker shall be placed between plugs and caps and the concrete thrust block to facilitate their removal in the future. Thrust blocks shall be poured against undisturbed earth and shall have at least the minimum dimensions shown in the details of the Standard Drawings.

C. Mechanical Couplings - Oil, scale, rust and dirt shall be cleaned from pipe ends. The Contractor shall clean gaskets in couplings prior to installing the coupling in accordance with the manufacturer's recommendations
Bolt threads shall be lubricated with graphite and oil prior to installation.

1. Painting and Coating
   a. The Contractor shall coat buried flexible pipe couplings, transition couplings, and flanged coupling adapters per Section 78-17 and then wrap the couplings with polyethylene wrap per AWWA C-105.
   b. The Contractor shall coat flexible pipe couplings (including joint harness assemblies), transition couplings, and flanged coupling adapters located indoors, in vaults and structures, and above-ground with the same coating system as specified for the adjacent pipe. A prime coat shall be applied at the factory.

Polyethylene Encasement - The polyethylene encasement shall prevent contact between the pipe and the surrounding backfill and bedding materials, but is not intended to be a completely airtight or watertight enclosure. All lumps of clay, mud, cinders, etc. on the pipe surface shall be removed prior to installation of the polyethylene encasement. During installation, care shall be exercised to prevent soil or embedment material from becoming trapped between the pipe and the polyethylene.

The polyethylene film shall be fitted to the contour of the pipe to effect a snug, but not tight, encasement with a minimum space between the polyethylene and the pipe. Sufficient slack shall be provided in contouring to prevent stretching the polyethylene where it bridges irregular surfaces, such as bell-spigot

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interfaces, bolted joints, or fittings, and to prevent damage to the polyethylene due to backfilling operations. Overlaps and ends shall be .secured with adhesive tape.

For installations below the water table, both ends of the polyethylene tube shall be sealed as thoroughly as possible with adhesive tape at the joint overlap.

Installation of polyethylene encasement shall be in accordance with the Standard Drawings and AWWA C-105, Method A. The following summarizes this method.

A. Installation of Polyethylene Encasement for Pipe - Cut polyethylene tube to a length approximately 2 feet longer than the pipe section. Slip the tube around the pipe, centering it to provide a 1-foot overlap on each adjacent pipe section, and bunching it accordion fashion lengthwise until it clears the pipe ends.
   Lower the pipe into the trench and make up the pipe joint with the preceding section of pipe. A shallow bell hole must be made at the joints to facilitate installation of the polyethylene tube.
   After assembling the pipe joint, make the overlap of the polyethylene tube. Pull the bunched polyethylene from the preceding length of pipe, slip it over the end of the new length of pipe, and secure it in place. Then slip the end of the polyethylene from the new pipe section over the end of the first wrap until it overlaps the joint at the end of the preceding length of pipe. Secure the overlap in place. Take up the slack width at the top of the pipe to make a snug, but not tight, fit along the barrel of the pipe, securing the fold at quarter points.
   Any cuts, tears, punctures, or other damage to the polyethylene, shall be repaired as described below. Proceed with installation of the next section of pipe in the same manner.
B. Installation of Polyethylene Encasement for Appurtenances - Cover bends, reducers, offsets, and other pipe-shaped appurtenances with polyethylene in the same manner as the pipe. When it is not practical to wrap tees, crosses, and other odd-shaped pieces in a tube, the items shall be wrapped with a flat sheet or split length of polyethylene tube by passing the sheet under the appurtenance and bringing it up around the body. Seams shall be made by bringing the edges together, folding over twice, and taping down. Polyethylene shall be taped securely in place.
C. Repairs of Polyethylene Encasement - Repair any cuts, tears, punctures, or damage to polyethylene with adhesive tape, or with a short length of polyethylene sheet or a tube cut open, wrapped around the pipe to cover the damaged area, and secured in place.
D. Openings in Polyethylene Encasement - Provide openings for branches, service taps, blow-offs, air valves, and similar appurtenances by making an X- shaped cut in the polyethylene and temporarily folding back the fill. After the appurtenance is installed, tape the slack securely to the appurtenance and repair the cut, as well as, any other damaged areas in the polyethylene, with any resulting damaged areas being repaired, as described above.
E. Junctions with Unwrapped Pipe - Where polyethylene-wrapped pipe joins an adjacent pipe that is not wrapped, extend the polyethylene wrap, to cover the adjacent pipe for a distance of at least 3 feet away from the ductile iron pipe. Service lines of dissimilar metals shall be wrapped with polyethylene or a suitable dielectric tape for a minimum clear distance of 3 feet away from the ductile iron pipe.

Testing and Disinfection - Testing and disinfection shall be performed on all pipelines, in accordance with Section 78-13.

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78-5 DUCTILE IRON PIPE AND FITTINGS (GRAVITY SEWER FLOW)

78-5.01 GENERAL

This specification governs the furnishing and installation of ductile iron pipe material, including laying, joining, bedding and approvals. All incidentals and appurtenant operations necessary for the construction of pipelines shall be accomplished in strict accordance with the drawings and other terms and conditions of the contract.

The Contractor shall also furnish all equipment, tools, labor and materials required to relocate sewers, conduits, ducts, pipes, or other structures as may be necessary to complete the installation as shown and specified.

All standard specifications, i.e., AWWA, ASTM, etc., made a portion of these specifications by reference shall be the latest edition and revision thereof

The Contractor shall be responsible for all material furnished by him, and shall replace at his own expense, all material found defective in manufacture or damaged in handling after delivery by the manufacturer. This shall include the furnishings of all material and labor required to replace defective material discovered prior to final acceptance of the work.

The Contractor shall be responsible for the safe storage of material until it has been incorporated into the completed project. The interior of all pipe shall be kept free from dirt and foreign matter at all times.

Pipe surfaces shall be free from nicks, scratches and other blemishes. The joining surfaces of pipe spigots and bell sockets shall be free from gouges or other imperfections that might cause leakage.

Submittals - Submittals shall be provided for the following items plus all additional items required in the specifications for the particular type of pipe:

A. Pipe and joint material

78-5.02 MATERIALS

Ductile Iron Pipe (DI) - Ductile iron pipe shall conform to the quality and strength requirements of AWWA C-151.

A. Markings - Each standard or random length of pipe shall be clearly marked with the following:
   - The letters "DI" or "Ductile"
   - Nominal size and class
   - Year produced
   - Manufacturer's trade name and country where cast
   - Seal (mark) of testing agency

B. Pressure Class - Where the class is not indicated on the plans, the pipe shall be Class 350.
C. Laying Length - Standard laying lengths of 18 or 20 foot are acceptable.
D. Joint Type - Unless otherwise shown or specified, pipe joints shall be rubber gasket push-on type joint conforming to AWWA C-111.
E. Physical Test Requirements - Hydrostatic, tension test, and impact test shall be conducted at the factory in accordance with ASTM A 746. All testing shall be performed by a recognized testing laboratory with such testing available for inspection by the District. If required, the manufacturer shall supply a letter of certification attesting to their pipe meeting these specifications.
F. Lining and Coating - Lining and Coating shall be as specified on the plans or Special Conditions.
G. Polyethylene Encasement - Pipe and fittings shall be wrapped in polyethylene. Polyethylene wrapping shall be in accordance to with AWWA C-105 latest revision. Minimum thickness shall be 0.008 inch (8 mils).
H. Warning Tape - Two-inch-wide green non-metallic tape marked "sewerline" shall be used.

78-5.03 CONSTRUCTION

Handling and Transportation - Handling and transportation of pipe shall be in accordance with the pipe manufacturer's published instructions.

Heavy canvas, or nylon slings of suitable strength shall be used for lifting and supporting materials. Chains or cables shall not be used.

Pipe and fittings shall not be stored on rocks or gravel, or other hard material which might damage the pipe.

A. Rubber Gasket Storage - All rubber gaskets shall be stored in a cool, well ventilated place and not exposed to the direct rays of the sun. Gaskets shall not be allowed in contact with oils, fuels, petroleum, or solvents.

Pipe Laying - Pipe shall be laid in accordance with the pipe manufacturer's published instructions, as complimented and modified herein.

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A. Cleanliness - The interior of pipes shall be clean of foreign materials before sections of pipe are installed and shall be protected to prevent entry of foreign materials after installation.
Open ends of installed pipe shall be sealed with watertight plugs or other approved means at times when pipe installation is not in progress.
Ground water shall not be allowed to enter the pipe.

B. Inspection Before Installation - All pipe and fittings shall be carefully examined for cracks and other defects while suspended and before installation. Spigot ends shall be examined with particular care as this area is the most vulnerable to damage from handling. Defective pipe or fittings shall be laid aside for inspection by the District, who will prescribe corrective repairs or rejection.

C. Lowering of Pipe Material into Trench - Proper implements, tools, and equipment, satisfactory to the District, shall be provided and used by the Contractor for the safe and convenient performance of the work. Under no circumstances shall sewer main materials be dropped or dumped into the trench.
If damage occurs to any pipe or accessories in handling, the damage shall be immediately brought to the District's attention.

D. Laying of Pipe - Pipe shall be laid in trenches to the line and grade indicated on the plans and as specified.

Every precaution shall be taken to prevent foreign material from entering the pipe while it is being placed in the trench. If the pipe laying crew cannot install the pipe into the trench without getting earth into it, the District's Inspector may require a heavy tightly woven canvas bag of suitable size, or plastic caps, be placed over each end of the pipe prior to installation and left there until the connection is made to the adjacent pipe. During laying operations, no debris, tools, clothing or other material shall be placed in the pipe.

As each length of pipe is placed in the trench, the spigot end shall be centered in the bell or coupling, and the pipe forced home and brought to correct line and grade. The pipe shall be secured in place with approved backfill material tamped under it, except at the bells or couplings. Precautions shall be taken to prevent dirt from entering the joint space.

Joints shall be assembled in accordance with the manufacturer's instructions. Each joint shall be checked with a feeler gauge to assure proper seating of the gasket.

E. Cutting of Pipe - Field cuts and connections shall be in accordance with the pipe manufacturer's published instructions.
The cutting of pipe for inserting valves, fittings, or closure pieces, shall be done in a neat and workmanlike manner without damage to the pipe so as to leave a smooth end at right angles to the axis of the pipe.

F. Allowable Deflection - The maximum allowable angular deflection at the joints shall be 80 percent of manufacturer's recommendation for push-on and mechanical joints. Changes in direction greater than the allowable deflection shall be accomplished with manholes.

Polyethylene Encasement - The polyethylene encasement shall prevent contact between the pipe and the surrounding backfill and bedding materials, but is not intended to be a completely airtight or watertight enclosure. All lumps of clay, mud, cinders, etc., on the pipe surface shall be removed prior to installation of the polyethylene encasement. During installation, care shall be exercised to prevent soil or embedment material from becoming trapped between the pipe and the polyethylene.

The polyethylene film shall be fitted to the contour of the pipe to effect a snug, but not tight, encasement with a minimum space between the polyethylene and the pipe. Sufficient slack shall be provided in contouring to prevent stretching the polyethylene where it bridges irregular surfaces, such as bell-spigot interfaces, bolted joints, or fittings, and to prevent damage to the polyethylene due to backfilling operations. Overlaps and ends shall be secured with adhesive tape.

For installations below the water table, both ends of the polyethylene tube shall be sealed as thoroughly as possible with adhesive tape at the joint overlap.

Installation of polyethylene encasement shall be in accordance with the Standard Drawings and AWWA C-105, Method A. The following summarizes this method.

A. Installation of Polyethylene Encasement for Pipe - Cut polyethylene tube to a length approximately 2 feet longer than the pipe section. Slip the tube around the pipe, centering it to provide a 1-foot overlap on each adjacent pipe section, and bunching it accordion-fashion lengthwise until it clears the pipe ends.

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Lower the pipe into the trench and make up the pipe joint with the preceding section of pipe. A shallow bell hole must be made at the joints to facilitate installation of the polyethylene tube.

After assembling the pipe joint, make the overlap of the polyethylene tube. Pull the bunched polyethylene from the preceding length of pipe, slip it over the end of the new length of pipe, and secure it in place. Then slip the end of the polyethylene from the new pipe section over the end of the first wrap until it overlaps the joint at the end of the preceding length of pipe. Secure the overlap in place. Take up the slack width at the top of the pipe to make a snug, but not tight, fit along the barrel of the pipe, securing the fold at quarter points.

Any cuts, tears, punctures, or other damage to the polyethylene, shall be repaired as described below. Proceed with installation of the next section of pipe in the same manner.

B. Installation of Polyethylene Encasement for Appurtenances – Cover bends, reducers, offsets, and other pipe-shaped appurtenances with polyethylene in the same manner as the pipe. When it is not practical to wrap tees, crosses, and other odd-shaped pieces in a tube, the items shall be wrapped with a flat sheet or split length of polyethylene tube by passing the sheet under the appurtenance and bringing it up around the body. Seams shall be made by bringing the edges together, folding over twice, and taping down. Polyethylene shall be taped securely in place.

C. Repairs of Polyethylene Encasement – Repair any cuts, tears, punctures, damage to polyethylene with adhesive tape, or with a short length of polyethylene sheet or a tube cut open, wrapped around the pipe to cover the damaged area, and secured in place.

Testing and Disinfection --- Testing and disinfection shall be performed on all pipelines, in accordance with Section 78-13.

78-6 POLYVINYL CHLORIDE PIPE AND FITTIINGS (PVC) (PRESSURE FLOW)

78-6.01 GENERAL

This specification governs the furnishing and installation of PVC pipe material and main line fittings including laying, jointing, bedding, and approvals. All incidentals and appurtenant operations necessary for the construction of water mains shall be done in strict accordance with the drawings and other terms and conditions of the contract.

Fitting types covered under this section include bends, tees, crosses, reducers, couplings, caps, plugs, adapters and all other fittings necessary for a complete pipeline installation.

The Contractor shall also furnish all equipment, tools, labor and materials required to relocate sewers, conduits, ducts, pipes, or other structures as may be necessary to complete the installation as shown and specified .

All standard specifications; i.e., AWWA, ASTM, etc., made a portion of these specifications by reference shall be the latest edition and revision thereof.

The Contractor shall be responsible for all material furnished by him and shall replace at his own expense, all material found defective in manufacture or damaged in handling after delivery by the manufacturer. This shall include the furnishings of all material and labor required to replace defective material discovered prior to final acceptance of the work.

Pipe surfaces shall be free from nicks, scratches and other blemishes. The joining surfaces of pipe spigots and of integral bell and sleeve reinforced bell sockets shall be free from gouges or other imperfections that might cause leakage.

Storage and Care - The Contractor shall be responsible for the safe storage of material until it has been incorporated into the completed project. The interior of all pipe and fittings shall be kept, free from dirt and foreign matter at all times.

Pipe shall be stored at the job site in unit packages provided by the manufacturer. Caution shall be exercised to avoid compression, damage or deformation to bell ends of the pipe. If pipe is to be exposed to direct sunlight for more than 14 days, pipe must be covered with an opaque material while permitting adequate air circulation above and around the pipe to prevent excessive heat accumulation. Gaskets

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shall be protected from excessive exposure to heat, direct sunlight, ozone, oil and grease. Solvent cement when used shall be stored in tightly sealed containers from excessive heat.

Submittals - Submittals shall be provided for the following items plus all additional items required in the specifications for the particular type of pipe:

1. Pipe and jointing material
2. Fittings
3. Specialties

78-6.02 MATERIALS

Polyvinyl Chloride Pipe (PVC) - PVC pipe shall conform to AWWA C-900, titled "Polyvinyl Chloride Pipe (PVC) Pressure Pipe 4 Inches through 12 Inches for Water" and shall have the same outside diameter (O.D.) as that of cast iron pipe (C.I.P.O.D.) in the sizes furnished.

A. Markings - Each standard or random length of pipe shall be clearly marked with the following:
   - Nominal size and O.D. base; i.e., 6 inch cast iron pipe size
   - Material code "PVC 1120"
   - Dimensional ratio; i.e., DR 18 where DR is equal to thickness “divided by” diameter
   - AWWA pressure class; i.e., PC 150
   - AWWA designation "AWWA C-900"
   - Manufacturer's trade name and production record code
   - Seal (mark) of testing agency

B. Pressure Class - Where the class is not indicated on the plans, the pipe shall be Class 150.

C. Laying length - The standard laying length shall be 20 feet (plus or minus 1 inch) in all classes. A maximum of 15 percent may be furnished in random lengths of not less than 10 feet each.

D. Joint Type - Pipe joints shall be made using an integral bell with an elastomeric gasket push-on type joint or using machined couplings or a sleeve type with rubber ring gaskets and machined pipe ends to form a push-on type joint.
   Solvent cement joints are strictly prohibited.
   One coupling complete with on gasket each shall be factory assembled to each length of standard length pipe furnished. Couplings shall be the same class as the pipe. Manufacturer shall furnish gasket lubricant for each quantity of pipe furnished. When additional couplings are furnished as separate items, two gaskets shall be furnished and installed in the gasket recess of each coupling.
   1 Couplings - Where couplings are used, they shall meet the requirements of AWWA C-900. Couplings shall be as furnished by the manufacturer. Couplings shall be marked with same information as the pipe.

E. Physical Test Requirements - Hydrostatic burst and sustained pressure and crushing tests shall be conducted at the factory in accordance with AWWA C-900. All testing shall be subject to inspection by the District. If required, the manufacturer shall supply a letter of certification attesting to their pipe meeting these specifications.

F. Locating Wire - Locating wire shall be single strand, 10-gauge copper wire, with solid thermoplastic insulation.

G. Warning Tape - Warning tape shall be 2-inch-wide non-metallic tape marked "waterline."

Fittings - All cast and ductile iron fittings shall be manufactured in accordance with the following AWWA Standards: C104 "Cement-Mortar Lining for Ductile-Iron Pipe and Gray-Iron and Fittings for Water," C110, "Gray-Iron and Ductile-Iron Fittings, 3 Inches through 48 Inches for Water and Other Liquids". C111, “Rubber-Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings," with the following additional requirements or exceptions. All fittings shall be furnished with a cement-mortar lining of standard thickness as defined in referenced specifications.

All fittings shall be rated equally to the class of pipe. End connections may be push-on, mechanical, or flanged joints except where specifically shown otherwise on the plans or Standard Drawings.

Ductile iron compact fittings, per AWWA C153, are allowed.

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A. Flanges. Bolts and Gaskets - Flanges shall be flat-faced and meet either the requirements of AWWA C-207 for steel hub type flange fittings, or AWWA C-110 Section 10-18 for ductile iron fittings. The flanges shall be marked with the size, name or trademark of the manufacturer and with the AWWA Class; i.e., "E", or pressure rating.
Bolts and nuts shall be cadmium plated, A307, Grade B of domestic origin.
Cadmium plating shall conform to Federal Specification QQ-P-415-1956, Type 1, Class 1. Gaskets shall be 1/8-inch thick and be of the full face self-centered cloth impregnated type. The following table shows the bolt pattern for ASME/ANSI 16.1 Class 125 cast iron flange. This pattern is rated at 275 psi for Class E steel pipe flanges and 250 psi for ductile iron pipe fittings.

Pipe Size	Bolt Hole Diameter (inches)	Bolt Diameter & Length (Inches)	Number of Bolts
6"	7/8	¾" x 3 1/2	8
8"	7/8	¾" x 3 1/2	8
10"	1	7/8 x 4	12
12"	1	7/8 x 4	12
14"	1 1/8	1 x 4 1/2	12
16"	11/8	1 x 4 1/2	16
18"	1/1/4	1 1/8 x 5	16

The contractor shall uniformly tighten the bolts and prevent bending or torsional strains. Proper anchorage shall be provided.

B. Mechanical Joint Fittings - The mechanical joints shall meet AWWA C111. That standard covers the joint as well as gaskets and bolts. T-bolts and nuts shall be manufactured of corrosion-resistant high-strength low-alloy Cor-Ten steel or equal. Number and length of bolts shall be as follows:

Pipe Size	Number of Bolts	Bolt Diameter & Length (inches)
6”	6	¾ x 3 ½
8”	6	¾ x 4
10”	8	¾ x 4
12”	8	¾ x 4
14”	10	¾ x 4
16”	12	¾ x 4 ½
18”	12	¾ x 4 ½

C. Coatings and Linings - Cast iron fittings shall be cement mortar lined per AWWA C-104 and receive a bituminous coating per AWWA C110.
Threaded holes and mating surfaces shall not be coated. Flange faces shall be coated with asphaltic varnish only. There shall be no coating materials or mortar in gasket grooves.

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D. Mechanical Couplings - Couplings include transition couplings, flanged coupling adapters, flexible and insulated couplings.
   1. Coupling Sleeves and Flanges - Coupling sleeves and flanges may be of gray iron or carbon steel.
   2. Bolts and Nuts for Flanges - Bolts and nuts for buried and submerged flanges, flanges in underground vaults and structures, and flanges located outdoors above ground shall be cadmium plated, A307, Grade B. Provide one washer for each nut. Each washer shall be of the same material as the nut.

78-6.03 CONSTRUCTION

Handling and Transportation - Handling and transportation of pipe shall be in accordance with the pipe manufacturer's published instructions.

Heavy canvas or nylon slings of suitable strength shall be used for lifting and supporting materials. Chains or cables shall not be used.

Pipe and fittings shall not be stored on rocks or gravel, or other hard material which might damage the pipe.

A. Rubber Gasket Storage - All rubber gaskets shall be stored in a cool, well- ventilated place and should not be exposed to the direct rays of the sun. Gaskets shall not be allowed in contact with oils, fuels, petroleum, or solvents.

Pipe Laying - Pipe shall be laid in accordance with the pipe manufacturer's published instructions, as complimented and modified herein and in the plans.

A. Cleanliness - The interior of pipes shall be clean of foreign materials before sections of pipe are installed and shall be protected to prevent entry of foreign materials after installation.
   Open ends of installed pipe shall be sealed with watertight plugs or other approved means at times when pipe installation is not in progress.
   Ground water shall not be allowed to enter the pipe.
B. Inspection Before Installation - All pipe and fittings shall be carefully examined for cracks and other defects just prior to installation. Spigot ends shall be examined with particular care as this area is the most vulnerable to damage from handling. Defective pipe or fittings shall be laid aside for inspection by the District, who will prescribe corrective repairs or ejection.
C. Lowering of Pipe Material into Trench - Proper implements, tools, and equipment, satisfactory to the District, shall be provided and used by the Contractor, for the safe and convenient performance of the work. All pipe, fittings, valves, and hydrants shall be carefully lowered into the trench piece by piece in such a manner as to prevent damage to the water main materials and protective coatings and linings. Under no circumstances shall water main materials be dropped or dumped into the trench.
   If damage occurs to any pipe, fittings, valves, hydrants or water main accessories in handling, the damage shall be immediately brought to the District's attention.
D. Laying of Pipe - Pipe shall be laid in trenches to the line and grade indicated on the plans and as specified.
   Every precaution shall be taken to prevent foreign material from entering the pipe while it is being placed in the trench. If the pipe laying crew cannot install the pipe into the trench without getting earth into it, the District Inspector may require a heavy tightly-woven-canvas bag of suitable size, or plastic caps to be placed over each end of the pipe prior to installation and left there until the connection is made to the adjacent pipe. During laying operations, no debris, tools, clothing or other material shall be placed in the pipe.
   As each length of pipe is placed in the trench, the spigot end shall be centered in the bell or coupling, and the pipe forced home and brought to correct line and grade. The pipe shall be secured in place with approved backfill material tamped under it, except at the bells or couplings. Precautions shall be taken to prevent dirt from entering the joint space.
   Joints shall be assembled in, accordance with the manufacturer's instructions. Rubber rings and ring grooves shall not be lubricated. Each joint shall be checked with a feeler gauge to assure proper seating of the gasket.

NOT FOR CONSTRUCTION

E. Cutting of Pipe - Field cuts and connections shall be in accordance with the pipe manufacturer's published instructions.
The cutting of pipe for inserting valves, fittings, or closure pieces shall be done in a neat and workmanlike manner without damage to the pipe so as to leave a smooth end at right angles to the axis of the pipe. The pipe shall be marked around its entire circumference prior to cutting to assure a square cut. A factory-finished beveled end shall be used as a guide for proper bevel angle (15°) and depth of bevel plus the distance to the insertion reference mark. The end shall be beveled using a PVC pipe beveling tool. Round off any sharp edges on the leading edge of the bevel with a pocket knife or a file.
When installing 8, 10 and 12-inch PVC pipe, mechanical joint or push-on type fittings designed for ductile iron pipe shall be used. When connecting PVC pipe into the bell end of cast iron pipe or into push-on type fittings, the end should be re-beveled, similar to the bevel on ductile iron pipe. When connecting to mechanical joint fittings, the end of the PVC pipe should not be beveled.

F. Allowable Deflection - No deflection shall be allowed at the joints.
The maximum allowable angular deflection at twin-gasketed couplings shall be 5 degrees.

The pipe shall not be bent to a lesser radius than the minimum shown below:

Size. inches	Minimum Radius of Curvature. Ft.
4	190
6	200
8	250
10	Fittings required
12	Fittings required

G. Locating Wire - Locating wire shall be installed with non-metallic water pipe as indicated on the Standard Drawings.

H. Warning Tape – Warning tape shall be placed on top of pipe zone backfill centered over pipe as shown on the Standard Drawings.

Fittings - Fittings shall be installed in the manner specified herein for cleaning, laying and joining pipe.

A. Anchorage for Fittings - All fittings, unless otherwise specified, shall be provided with a thrust block constructed against undisturbed soil as shown on the Standard Drawings.

B. Thrust Blocks - Thrust blocks shall be constructed of Class B Concrete. Care shall be taken not to obstruct the outlets of tees or crosses which are intended for future connections. A waterproof paper or plastic bond- breaker shall be placed between plugs and caps and the concrete thrust block to facilitate their removal of the concrete in the future. Thrust blocks shall be poured against undisturbed earth and shall have at least the minimum dimensions shown on the Standard Drawings.

C. Mechanical Couplings - Oil, scale, rust, and dirt shall be cleaned from pipe ends. The Contractor shall clean gaskets in couplings prior to installing the coupling in accordance with the manufacturer's recommendations:
Bolt threads shall be lubricated with graphite and oil prior to installation.
1. Painting and Coating -
   a. The Contractor shall coat buried flexible pipe couplings, transition couplings, and flanged coupling adapters per Section 78-17 and then wrap the couplings with polyethylene wrap per AWWA C-105.
   b. The Contractor shall coat flexible pipe couplings (including joint harness assemblies), transition couplings, and flanged coupling adapters located indoors, in vaults and structures, and above-ground with the same coating system as specified for the adjacent pipe. A prime coat shall be applied at the factory.

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D. Polyethylene Wrap - All ferrous metal shall be protected with polyethylene wrap. When it is not practical to wrap tees, crosses, and other odd-shaped pieces in a tube the item shall be wrapped with a flat sheet or split length of polyethylene tube by passing the sheet under the appurtenance and bringing it up around the body. Seams shall be made by bringing the edges together, folding over twice, and taping down. Polyethylene shall be taped securely in place.
Cuts, tears, punctures, or damage to polyethylene shall be repaired with adhesive tape, or with polyethylene sheet secured in place with adhesive tape.

Testing and Disinfection - Testing and disinfection shall be performed on all pipelines in accordance with Section 78-12.

78-7 POLYVINYL CHLORIDE (PVC) PIPE AND FITIINGS (GRAVITY SEWER FLOW)

78-7.01 GENERAL

This Section of the specifications will govern the furnishing and installation of PVC pipe material and fittings; including laying, jointing, bedding, testing and approvals. All incidentals and appurtenant operations necessary for the construction of pipelines shall be done in strict accordance with the drawings and other terms and conditions of the contract.

The Contractor shall also furnish all equipment, tools, labor and materials required to rearrange sewers, conduits, ducts, pipes, or other structures as may be necessary to provide installation as shown and specified.

All standard specifications, i.e., ASTM, etc., made a portion of these specifications by reference shall be the latest edition and revision thereof.

The Contractor shall be responsible for all material furnished by him and shall replace it at his own expense, should the material be defective in manufacture or damaged in handling after delivery by the manufacturer. This shall include the furnishing of all material and labor required to replace defective material discovered prior to final acceptance of the work.

Pipe surfaces shall be free from nicks, scratches and other blemishes. The joining surfaces of pipe spigots and of integral bell and sleeve reinforced bell sockets shall be free from gouges or other imperfections that might cause leakage.

Storage and Care - The Contractor shall be responsible for the safe storage of material furnished by or to him and accepted by him, and intended for the work, until it has been incorporated in the completed project. The interior of all pipe and fittings shall be kept free from dirt and foreign matter at all times.

Pipe shall be stored at the job site in unit packages provided by the manufacturer. Caution shall be exercised to avoid compression, damage or deformation to bell ends of the pipe. If pipe is to be exposed to direct sunlight for more than 14 days, pipe must be covered with an opaque material while permitting adequate air circulation above and around the pipe to prevent excessive heat accumulation.

Gaskets shall be protected from excessive exposure to heat, direct sunlight, ozone, oil and grease. Solvent cement when used shall be stored in tightly sealed containers away from excessive heat.

Submittals - Submittals shall be provided for the following items plus all additional items required in the specifications for the particular type of pipe:

1. Pipe and jointing material
2. Fittings
3. Specialties

78-7.02 MATERIALS

Polyvinyl Chloride Pipe (PVC) and Fittings - PVC pipe and fittings shall be made in accordance to ASTM D-3034 or ASTM F679, and ASTM D 1784 in both physical, dimensional and chemical requirements. Pipe shall be green unless otherwise approved.

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A. Markings - Each standard or random length of pipe shall be clearly marked with the following
   - Manufacturer's name
   - Nominal pipe size, i.e. 6-inch
   - Cell classification or material code; i.e. 12454-B
   - Dimension ratio; i.e. SDR35
   - Product type; i.e. Type PSM
   - Standard specification designation; i.e. 03034
   - Production code

B. Pipe Class - The SDR or wall thickness shall be as shown on the plans.

C. Laying Length - The standard laying length shall be 20 feet (plus/minus) 1 inch. A maximum of 15 percent may be furnished in random lengths of not less than 10 feet each.

D. Joint Type - Pipe joints shall be constructed with an integral bell and spigot with an elastomeric gasket push-on-type joint. Each spigot shall have a reference mark to facilitate pipe assembly. The gasket shall be contained in a machined groove on the pipe spigot such that when compressed the gasket will not displace and will form a positive seal. The gasket shall meet all requirements of ASTM F-477, pipe lubricant shall be listed with NSF (National Sanitation Foundation).
   Solvent cement joints are strictly prohibited.

D. Physical Test Requirements
   1. Material - Material samples shall be taken at the beginning of production and tested for compliance to ASTM D-3034 or ASTM F794.
   2. Product Quality - The following tests shall be performed on a sample of pipe.
      Flattening - Three specimens of pipe per pipe size furnished, minimum of 6 inches long, shall be flattened between parallel plates in a suitable press until the distance between the plates is 40% of the outside diameter of the pipe. The rate of loading shall be uniform and such that the compression is completed within 2-5 minutes. Remove the load, and examine the specimens for splitting, cracking, or breaking.
      Pipe Stiffness - The pipe stiffness shall be determined utilizing procedures similar to those outlined in ASTM D2412. The stiffness of pipe shall be determined at a 5% deflection datum. Test specimens shall be a minimum of two pipe diameters or 4 feet in length, whichever is less.
      Joint Tightness - Joint tightness shall be tested in accordance with ASTM D3212.
      The manufacturer shall provide a certificate of conformance for the above tests. Tests shall be performed on materials and products from the same lot of those furnished to the project.
      Plant Inspection - The District may require inspection of production of the pipe. When requested, the manufacturer shall provide advance notice of when and where production of materials will begin.

E. Struts - All pipe, 24 inches in diameter and greater, shall be strutted prior to placement in the trench. Each strut shall consist of 2-2x4's placed in a perpendicular cross. A minimum of 4 struts equally spaced shall be placed per pipe length. Struts are to be removed prior to backfill above the pipe zone.

Warning Tape - Warning tape shall be 2-inch wide green non-metallic tape marked “sewer line”.

Fittings - All fittings shall be as manufactured and furnished by the pipe supplier or approved equal and have bell and/or spigot configurations compatible with the pipe.

78-7.03 CONSTRUCTION

Handling and Transportation - Handling and transportation of pipe shall be in accordance with the pipe manufacturer's published instructions.

Heavy canvas or nylon slings of suitable strength shall be used for lifting and supporting materials. Chains or cables shall not be used.

Pipe and fittings shall not be stored on rocks or gravel, or other hard material which might damage the pipe.

A. Rubber Gasket Storage - Store all rubber gaskets in a cool, well ventilated place and do not expose to the direct rays of the sun. Do not allow contact with oils, fuels, petroleum, or solvents.

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Pipe Laying

A. General - Pipe shall be laid in accordance with the pipe manufacturer's published instructions, as complimented and modified herein.

B. Cleanliness - The interior of pipes shall be clean of foreign materials before sections of pipe are installed and shall be protected to prevent entry of foreign materials after installation.

Open ends of installed pipe shall be sealed with watertight plugs or other approved means at times when pipe installation is not in progress.

Groundwater shall not be allowed to enter the pipe.

C. Inspection Before Installation - All pipe and fittings shall be carefully examined for cracks and other defects while suspended and before installation. Spigot ends shall be examined with particular care as this area is the most vulnerable to damage from handling. Defective pipe or fittings shall be laid aside for inspection by the District, who will prescribe corrective repairs or rejection.

D. Lowering of Pipe Material into Trench - Proper implements, tools, and equipment, satisfactory to the District, shall be provided and used by the Contractor, for the safe and convenient performance of the work. All pipe shall be carefully lowered into the trench piece by piece in such a manner as to prevent damage to the materials. Under no circumstances shall the pipe be dropped or dumped into the trench.

If damage occurs to any pipe or accessories in handling, the damage shall be immediately brought to the District's attention.

E. Laying of Pipe - Pipe laying shall proceed upgrade with spigot ends pointing in the direction of flow. After a section of pipe has been lowered into the prepared trench, the Contractor shall clean the end of the pipe to be joined, the inside of the joint, and the rubber ring immediately before joining the pipe. The assembly of the joint shall be made in accordance with the recommendations of the manufacturer of the type of joint used. The bell and spigot joint shall be pushed "home" in line with the installation band. If a piece has been cut, the usable end shall be clearly marked to show the proper amount of installation distance. All special tools and appliances required for jointing assembly shall be provided by the Contractor.

After the joint has been made, the Contractor shall check pipe for alignment and grade. The trench bottom shall form a continuous and uniform bearing and support along the length of the pipe between joints. Sufficient pressure in making the joint shall be applied to assure proper pipe alignment and joint makeup. Sufficient pipe zone material shall be placed to secure the pipe and prevent movement before the next joint is installed.

When pipe is laid within a movable trench shield, all necessary precautions shall be taken to prevent pipe joints from pulling apart when moving the shield ahead.

Precautions shall be taken to prevent excavated or other foreign material from getting into the pipe during the laying operation. At all times, when laying operations are not in progress, or whenever the workers are absent from the job, the Contractor shall close and block the open end of the last laid section of pipe to prevent entry of foreign material or creep of the gasketed joints.

Pipes which are stubbed off for manhole construction or for connection by others shall be plugged or closed off with temporary plugs as specified in the manhole specifications.

The Contractor shall take all precautions necessary to prevent the "uplift" or floating of the line prior to the completion of the backfilling operation.

Where pipe is connected to manholes or concrete structures without using a flexible connector, connections shall be made so that the standard pipe joint is located not more than 2 feet from the outside edge of the structure unless otherwise shown.

F. Cutting of Pipe - Field cuts and connections shall be in accordance with the pipe manufacturer's published instructions.

The cutting of pipe for fittings or closure pieces shall be done in a neat and workmanlike manner without damage to the pipe so as to leave a smooth end at right angles to the axis of the pipe. The pipe shall be marked around its entire circumference prior to cutting to assure a square cut. A factory- finished beveled end shall be used as a guide for proper bevel angle and depth of bevel plus the distance to the insertion reference mark. The end shall be beveled using manufacturer

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recommendations. Sharp edges on the leading edge of the bevel shall be rounded off with a pocket knife or a file.

78-8 GATE VALVES

78-8.01 GENERAL

This specification governs materials and installation of gate valves. Valves shall be furnished and installed by the Contractor at the locations shown on the approved plans, or as required by the District.

Submittals - Prior to the purchase of gate valves to be used in the District's system, the following items shall be submitted and approved by the District:

- Manufacturer's catalog data and detail construction sheets showing the size to be used, valve dimensions, pressure rating, and materials of construction.
- Manufacturer's catalog data and NSF certification seal on the lining to be used.

78-8.02 MATERIALS

Gate Valves 3 inches and Larger - Gate valves 3 inches and larger, shall be resilient- seated suitable for buried service and meet the requirements of AWWA C-509, manually operated. All such valves shall be of the non-rising stem type, with double o-ring seal and shall tum to the left in a counter-clockwise direction to open the valve.

All valves shall be suitable for frequent operation as well as service involving long periods of inactivity. Valves shall be capable of operating satisfactorily with flows in either direction and shall provide zero leakage past the seat.

A. Valve Body -- Body, bonnet, operating nut, and stuffing box shall bee of iron with internal working parts of solid bronze. Exposed cap screws, bolts and nuts shall be stainless steel type 304.
The word "open" and an arrow, indicating the direction to open, shall be cast on each valve body or operator.
B. Valve Operator -- Valve operators shall be equipped with a 2-inch AWWA square operating nut. They shall be sealed and gasketed and lubricated for underground service. The operator shall be capable of withstanding an input torque of 450 ft. lbs. at extreme operator position without damage.
C. Coating and Lining -- Interior surfaces, excluding seating areas, bronze, and stainless steel pieces, shall be epoxy lined to a dry film thickness of 12 mils.
Liquid epoxy linings shall be applied in two coats. Liquid epoxy coating materials shall be listed in the NSF Listing for Drinking Water Additives, Standard 61, as certified for use in contact with potable water. Powder epoxy coating materials shall contain 100 percent solids. Surface preparation shall include White Metal Blast Cleaning.
Exterior surfaces shall be shop coated with two coats of asphalt varnish conforming to AWWA C-509. Flange faces shall be coated with a rust preventive compound.
D. Marking -- The manufacturer shall show on the valve the size, manufacturer, class and year.
E. Gate - Gate shall be cast or ductile iron encapsulated in Buna-N rubber or nitrite elastomer.
F. Types of End Connection - End connections may be either flanged, push-on mechanical joint type per Section 78-4 or Section 78-6.

Gate Valves 3 Inches and Smaller

A. Aboveground Valves - Aboveground threaded end gate valves, 1/4-inch through 3 inches for water service, shall be non-rising stem, screwed bonnet, solid wedge disc type having a minimum working pressure of 220 psi. The body, bonnet, and stem shall be of bronze, ASTM B 62. Hand wheels shall be of brass. Packing shall be Teflon asbestos.
B. Buried Valves - Buried gate valves for water service shall be iron body, bronze mounted, non-rising stem type, double disc, parallel seat, and shall have a working pressure of at least 200 psi.
Valves shall have flanged or threaded ends to match the pipe ends. Valves supplied with threaded ends shall not be in direct contact with the soil.
Valves shall have a 2-inch AWWA operating nut.
Bonnet and stuffing box bolts shall be cadmium plated steel. Discs, disc nut, disc ring, and seat ring shall be bronze.

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78-8.03 CONSTRUCTION

Storage - Valves shall be delivered and stored in the field with the port openings covered with plastic, cardboard or wood. These covers shall remain in place until the valve is ready to be installed. Valves shall not be stored in contact with bare ground. Valves shall not be stacked on top of one another.

Installation - The weight of the valve shall be supported by firm ground or concrete blocking and not by the pipe. Buried valves having the top of the operating nut greater than three feet below the finished surface shall be provided with shaft extensions.

A. Flanged Connection - Bolt holes of flanged valves shall straddle the horizontal and vertical axis of the pipe to which the valves are attached. Flanges, bolts and nuts shall be cleaned by wire brushing before installing flanged valves. Threads on nuts and bolts shall be lubricated with oil and graphite. Nuts and bolts shall be tightened uniformly and progressively. If flanges leak under pressure testing, the Contractor shall loosen or remove the nuts and bolts, reseat or replace the gasket, reinstall or retighten the bolts, and retest the joints. Joints shall be watertight.

   Bolts shall be tightened in an even manner by a series of steps until the torque required by the manufacturer is reached.

B. Threaded Connection - Threaded joints shall be cleaned by wire brushing or swabbing. Teflon joint compound or Teflon tape shall be applied to pipe threads before installing threaded valves. Joints shall be watertight.

C. Push-on Connection - Rubber ring grooves of joints shall be inspected before installation by the Contractor for ridges or holes that would interfere with the rubber ring. Interferences with the rubber rings shall be corrected to a satisfactory condition or the valve replaced, as required by the District.

   The pipe to be stabbed into the valve shall be beveled. Pipe shall be stabbed into the valve to the "Insertion Depth" as specified by the manufacturer.

D. Mechanical Joint - Valve socket, gland, and pipe plain end shall be wiped clean of all sand, dirt and other foreign material prior to valve installation. Bolts shall be tightened in a manner by a series of steps until the torque required by the manufacturer is reached.

E. Polyethylene Encasement - Valves and all bolted connections shall be encased with 10 mil polyethylene plastic film wrap installed as follows: The valves shall be wrapped by passing the flat sheet of film under the valve bottom and bringing the ends up around the body to the stem and securing it in place with 2-inch strips of the plastic adhesive tape. The polyethylene shall be secured around the valve stem in such a manner as to leave the stem free to operate. The film shall be brought completely around the flanges and secured to the pipe with a plastic adhesive tape on either side of the valve, flange or fitting.

F. Operation - Immediately before installation, each valve shall be operated through one complete open-close cycle and visually checked for proper operation. Boxing of valves shall begin immediately after pipe sections containing the valve have been installed. All valve boxes, paving rings, and lids shall be brought to grade after pavement has been constructed.

78-9 AIR AND VACUUM VALVE ASSEMBLIES

78-9.01 GENERAL

This specification governs materials and installation for air release, air and vacuum, or combination air-vacuum and air release valve assemblies. The type of air valve to be installed shall be as indicated on the plans. Valve assemblies include all items from the main pipeline to the valve vent as shown on the Standard Drawings.

Submittals - Prior to the purchase of valves to be used in the District system, the following items shall be submitted and approved by the District:

A. Manufacturer's catalog data showing valve type and size to be used, valve dimensions, pressure rating and materials of construction.

78-9.02 MATERIALS

Valves - Valve bodies shall be of high strength cast iron. The float, seal, and all moving parts shall be of Type 316 stainless steel. Seat washers and gaskets shall be of Buna-N, Nutrile Rubber. Valves shall be

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designed for a minimum pressure of 150 psi unless otherwise shown. Valves shall be designed to perform the following function:

A. Air Release Valve --- Air release valves shall be designed to release small amounts of air that can accumulate at high points in systems once they are filled and under pressure.
B. Air and Vacuum Valves --- Air and vacuum valves shall be designed :to: (1) expel large amounts of air from a system when it is being filled, (2) remain closed when the system is in operation and under pressure, and (3) open to allow air to enter when the line begins to drain and the internal pressure reverts to atmosphere.
C. Combination Air- Vacuum and Air Release Valves --- These valves combine the features of the air release, and the air and vacuum valves specified herein.

Valves Appurtenances - Materials for gate valves, piping, boxes, and fittings shall conform to the requirements of Technical Specifications 02645 and as shown on the Standard Drawings.

78-9.03 CONSTRUCTION

Installation - The tap for the air valves shall be made in a level section of pipe no closer than 18 inches to a bell, coupling, joint, or fitting.

Tapping mains shall conform to the standard procedures for house services.

Air valve assemblies shall be installed in accordance with the Standard Drawing.

Threaded joints shall be cleaned by wire brushing or swabbing. Teflon joint compound or Teflon tape shall be applied to pipe threads before installing threaded valves. Joints shall be watertight.

Dielectric connections with PVC tape wrap shall be provided at all connections between steel or iron and brass or bronze. Copper, brass, and other nonferrous metal pipe shall be isolated from steel or cast iron by insulated couplings or unions.

The Contractor shall also isolate nonferrous pipe from steel supports and pipe straps by means of insulating sleeves or tape wrapped around the pipe.

Testing - Air valve assemblies shall be tested at the same time that the connecting pipelines are pressure tested.

78-10 FIRE HYDRANT ASSEMBLIES

78-10.01 GENERAL

This specification governs materials and installation for fire hydrant assemblies. Fire hydrant assembly includes all items from the main line tee to the fire hydrant as shown on the Standard Drawings.

Submittals - Prior to the purchase of fire hydrants to be used in the City's system, the following items shall be submitted and approved by the City:

- Manufacturer's catalog data showing model, size, dimensions, and materials of construction.

78-10.02 MATERIALS

Fire Hydrants - Fire hydrants shall be dry barrel type meeting AWWA C502 and have a 6-inch bell inlet with two 2½ -inch hose outlets and one 4½ -inch pumper connection. Threads on the pumper and hose connections shall conform to the requirements of the fire department equipment of the area which they are to serve or if no standards exist, they shall conform to the "National Standard Screw Threads for Fire Hose Couplings and Fittings" published by the National Board of Fire Underwriters. Hydrants shall be designed to operate at a minimum of 200 psi working pressure and shall be tested hydrostatically to 400 psi. Fire hydrants shall open to the left (counterclockwise). The hydrant shall be cast iron and bronze mounted. Hydrants shall have a main valve opening size of four and one-half inches. The outlets shall be protected with caps attached to the hydrant head with a chain. Other specific requirements are:

- Hydrant materials shall comply with AWWA C502.

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- Hydrant flanges shall contain six equally spaced bolt holes of 7/8 -inch diameter on a 9 3/8 -inch diameter.
- All hydrants shall be permanently marked with the manufacturer's name and the year of the manufacture.
- Caps shall be metal-type.

Hydrant Lateral - Six-inch DI or PVC pipe shall be used. Hydrant laterals shall be pressure rated appropriately. Thrust block sizes shall be as shown in the Standard Drawings.

Hydrant Lateral Valve - The lateral valve shall be a 6-inch gate valve. The valve shall be stacked to the surface as shown on the Standard Drawings.

Spools and Bury - Hydrant burys shall be 6 inches inside the diameter and made of cast iron conforming to ASTM A-126. The burys shall be one piece with the top having a flange drilled with six holes to receive the extension spool or hydrant. The bottom shall have a 90° bend. The bury end shall be a push joint or mechanical joint fitting.

Bolts - Alloy steel break-off bolts shall be used to attach the fire hydrant to the extension spool.

78-10.03 CONSTRUCTION

Examination of Material - Prior to installation, all hydrants shall be inspected for direction of opening, nozzle threading, operating-nut and cap-nut dimensions, tightness of pressure-containing bolting, cleanliness of inlet elbow, handling damage, and cracks. Defective hydrants shall be corrected or held for inspection by the District.

Placement of Hydrant - All hydrants shall stand plumb and shall have their nozzles parallel with or at right angles to the curb, with pumper nozzle facing the curb.

Assembly Installation - Special attention is called to the following:

- The shoe of the fire hydrant bury must be anchored on a concrete thrust block.
- The fire hydrant shall be positioned so that the bolts between the extension piece and the hydrant are accessible, both top and bottom, within the limits shown on the Standard Drawing. If the hydrant is either too low or too high, it shall be corrected.
- Painting shall be per Section 78-17 with all metal surfaces above ground being painted, including any extensions. The extension piece shall be painted before installation. Color of hydrant will be determined by the local fire department.
- All underground iron fittings shall be wrapped with polyethylene.

Testing - Hydrants are to be tested at same time with the main. Dry-barrel hydrants shall have the drain valves tested in the following manner:

- Following the pressure test, open fire hydrant valve a few turns and allow hydrant to fill until water is at bottom of nozzle.
- Close hydrant valve and observe water level drop. If drop in water level is not visible, place palm of hand over open nozzle to feel a noticeable suction. If water level drop is not detectable, the hydrant has failed the drainage test.
- If the hydrant fails the drainage test, the drain valve may be clogged or backfill material does not permit free drainage. The Contractor shall make the necessary corrections and repairs to correct improper drainage.

78-11 DOMESTIC SERVICE LINES AND APPURTENANCES

78-11.01 GENERAL

This section governs materials and installation of the following:

A. Service line materials and fittings through 2”
B. Meter Boxes

Submittals - The following items shall be submitted and approved by the District.

NOT FOR CONSTRUCTION

A. Manufacturer's catalog data showing model, part number, pressure ratings and materials of construction.

78-11.02 MATERIALS

Service Line Materials and Fittings - Service line materials and fittings include service line pipe, service saddles, service fittings, meter stops, corporation stops, curb stops, and ball valves.

A. Polyethylene Tubing (PE) - PE tubing shall be in accordance with AWWA C901 and correspond to copper tubing size (CTS). The tubing shall be marked with the following:
   - Nominal size
   - Material code; i.e., PE 3406
   - The word "Tubing" and dimension ratio
   - AWWA pressure class; i.e., PC 160
   - AWWA designation AWWA C901
   - Manufacturer's name or trademark
   - Seal of testing agency

The polyethylene material shall be type "3408" conforming to ASTM D3350. The pressure class shall be a minimum of 200 psi.
Stainless steel liners or inserts shall be used with PE tubing when compression type connections are specified or shown.

B. Service Saddles - Service saddles shall be constructed of bronze, have AWWA iron pipe thread outlet taps, comply with AWWA C-800 "Threads for Underground Service Line Fittings" and have suitable means for attachment and sealing to a water main. The body shall be made to conform to outside configuration of the main. The service saddle shall be designed to provide a drip-tight connection when used as a service connection to the main. Saddles for ductile iron pipe shall be double strap. Straps for PVC pipe may also be stainless and shall provide full support around the circumference of the pipe and have a bearing area of sufficient width so that the pipe will not be distorted when the saddle is tightened.

C. Corporation Stops - Corporation stops shall be constructed of bronze, have AWWA iron pipe inlet threads, and shall comply with the requirements of AWWA C-800, "Threads for Underground Service Line Fittings." Outlets for ¾ -inch and 1-inch corporation stops shall have "stab type" connectors for joining to CTS polyethylene tubing. Male iron pipe threads shall be provided on the outlet side of 1 ½ -inch and 2-inch corporation stops.

D. Fittings - Fittings including PE tubing couplings, bends, unions, and adapters shall be constructed of bronze and shall be designed to join to CTS polyethylene tubing using a "stab type" connection (Mueller or approved equal) in 3/4-inch and 1-inch sizes and compression type connections in 1 ½ -inch and 2-inch sizes. Fittings shall also have male or female iron pipe- size-threaded ends and/or meter coupling nut or meter flange as required.

E. Angle Meter Stops - Angle meter stops shall be constructed of bronze, have lock wings and be suitable for joining to CTS polyethylene using a "stab type" connection for ¾ -inch and 1-inch angle meter stops and a compression type connection for 1 ½ -inch and 2-inch angle meter stops. Outlets for 3/4-inch and 1-inch angle meter stops shall consist of a meter coupling nut. 1 ½ -inch and 2-inch angle meter stops shall have meter flange outlets.

2.2 Meter Boxes - The meter boxes for ¾ -inch, 1-inch, 1 ½ -inch and 2-inch meters shall be concrete with steel lids in traffic areas. Plastic boxes and lids shall be used in non-traffic areas, according to the following:

Meter Size	Box Inside Dimensions (Min.)
¾ inch, 1 inch	10 x 17 inches
1 ½ inch, 2 inch	13 x 24 inches

NOT FOR CONSTRUCTION

78-11.03 CONSTRUCTION

Polyethylene Tubing - Tubing and fittings should be stored in a way that prevents damage due to crushing or piercing, excessive heat, harmful chemicals, or exposure to sunlight for prolonged periods. The manufacturer's recommendations regarding storage should be followed. Handling operations and trench installation and backfill shall be performed with reasonable care to prevent scratches, nicks, and gouges in the conduit.

Pipe excessively cut or kinked shall not be used.

Bends in PE tubing shall not occur closer than 10 diameters from any fitting .or valve. The minimum radius of curvature is 30 diameters or the coil radius when bending with the coil. Bending of coiled tubing against the coil shall not go beyond straight. Polyethylene tubing that becomes kinked during handling or installation shall not be used, and care should be taken to ensure that kinking does not develop after installation. Service line from the main line tap to the angle meter stop shall be one continuous length of tubing.

PE tubing shall be installed in trench bottoms with 6-inches of bedding material to provide continuous and uniform support. The initial backfill shall be 6 inches above the tubing and shall be materials free from rock, stones, and debris.

Service Saddles - The service saddle shall be no closer than 18 inches to a valve, coupling, joint, or fitting, unless it is at the end of the main.

The surface of the pipe shall be free of all loose material and have a hard, clean surface before placing the service saddle.

The service saddle shall be tightened firmly to ensure a tight seal, however, care shall be used to prevent damage or distortion of either the pipe, corporation stop or service saddle by over-tightening.

The drilling of the pipe shall be performed m accordance with the pipe manufacturer's recommendation.

Fittings. Angle Meter Stops. and Boxes - Installation of fittings, meter stops, and boxes shall be as recommended by the manufacturer. Pipe or fittings made of nonferrous metals (bronze) shall be isolated from ferrous metals with insulating unions or couplings.

Hydrostatic Testing - The Contractor shall hydrostatic test all appurtenances in place with the pipe being tested.

78-12 TESTING AND DISINFECTING WATER MAINS

78-12.01 GENERAL

All completed waterlines, as well as the service assemblies and appurtenant structures, will be tested by the Contractor in the Inspector's presence prior to field acceptance of the work. The Contractor shall correct all defects in workmanship or materials which become evident by inspection or testing at any time during the work. Testing shall be done after the complete installation and compaction of all underground utilities, except as modified below.

The Contractor shall furnish all pipe and fittings for connection to the main, pumps, pressure regulator, a calibrated water storage tank, disinfectant, and all other materials, fittings and pipelines required to perform the tests and make the necessary repairs.

When lines to be tested are in areas that will be paved, testing shall be done after the rock subgrade is placed and compacted. No lines shall be accepted as passing until all underground construction that may disturb the waterline is compacted.

The pressure test and the test for allowable leakage shall be performed simultaneously. Testing shall not commence until the water main and all appurtenances have been completely installed. The Contractor may, at any time and at his expense, perform his own pressure and leak test; however these tests will in no way offset the requirement for a final pressure and leak test.

NOT FOR CONSTRUCTION

After successfully testing the water main and appurtenances, they shall be flushed and disinfected.

After having been successfully tested and disinfected, the water main may be connected to the District's water system.

Submittals - The Contractor shall notify the District a minimum of 3 business days in advance of its proposed testing schedule for review and concurrence. If requested, the Contractor's proposed plans for water conveyance, disinfection, control, and disposal, shall also be submitted in writing.

78-12.02 MATERIALS

General - All test equipment, chemicals for chlorination, temporary valves, bulkheads, or other water control equipment and materials shall be determined and furnished by the Contractor, subject to the District's review. No materials shall be used which would be injurious to the construction or its future function.

Hydrostatic Testing Equipment - The Contractor shall be responsible for supplying and operating all testing equipment. In general, the testing equipment configuration shall consist of a pump receiving water from a calibrated storage tank. The pump discharge shall enter the water main through a tap or appurtenance. A pressure sustaining valve shall be placed on a tee located in the pump discharge line. Discharge from the pressure sustaining valve shall return to the calibrated storage tank. Other types or configurations of testing equipment shall be subject to District approval. The pressure pump shall operate continuous throughout the testing period. If the pump is stopped, the pressure shall not be allowed to drop more than 2 psi below test pressure before starting the pump.

Chlorine - Chlorine for disinfection shall be in the form of liquid chlorine, sodium hypochlorite solution, or calcium hypochlorite granules or 5-g tablets.

A. Liquid chlorine shall be in accordance with requirements of AWWA-B 301. Liquid chlorine shall be used only:
   1. In combination with appropriate gas flow chlorinators and ejectors.
   2. Under the direct supervision of an experienced technician.
   3. When appropriate safety practices are observed.

B. Sodium hypochlorite and calcium hypochlorite shall be in accordance with the requirements of AWWA-B 300, and containing approximately 65 percent available chlorine by weight.

78-12.03 CONSTRUCTION

General - The Contractor shall make all necessary provisions for conveying the water from the District designated source to the points of use.

All pressure pipelines shall be tested. Disinfection shall be accomplished by chlorination. All chlorinating and testing operations shall be performed in the presence of the District. Disinfection operations shall be scheduled by the Contractor as late as possible during the contract time period so as to assure the maximum degree of sterility of the facilities before the Work is accepted by the District. Bacteriological testing shall be performed by the District.

Release of water from pipelines, after testing and disinfecting have been completed, shall be in accordance with a written disposal plan reviewed by the Engineer.

Hydrostatic Testing - The purpose of the hydrostatic test is both to test the ability of the pipeline to withstand pressure and test for allowable leakage. These tests shall run simultaneously.

A. Preparation - Prior to testing, the water main shall be slowly and carefully filled with water. All air shall be expelled slowly from the pipe and appurtenances in a manner so as not to create excessive surge pressures. All appurtenances shall be left on during the testing procedure. The line shall be filled with water at least twenty-four hours prior to testing when the pipeline has a mortar lining, thus allowing the lining material to become saturated. Water for testing shall be introduced at the low end of the section being tested to facilitate the elimination of air in the pipeline prior to testing. Where air valves or other suitable

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outlets are not available for releasing air before applying the test, approved taps and fittings shall be installed and later securely plugged.
The Contractor may, at his own risk, test against existing valves. Suspected leaking of these valves will not be accepted as a reason for having not passed the leakage test requirements. These valves shall either be repaired or replaced prior to the start of another testing sequence. All new valves shall be tested against a reduced pressure side. Butterfly valves shall be tested in both directions.

B. Test Section Length - The length of pipe being tested at any one time shall not exceed 2,000 feet unless otherwise approved by the District.

C. Test Pressure - The test pressure shall be 200 psi or 50 psi greater than design pressure of the system, whichever is greater, measured at the lowest point of the section of the pressure zone being tested.

D. Test Duration - The test duration shall be two hours. Pressure in the water main shall be maintained within 2 psi of the calculated test pressure for the full two-hour duration. The individual testing of the valves may be of a shorter duration as approved by the District.

E. Allowable Leakage -The allowable leakage per test section shall be calculated from the formula contained in this subsection. Different sized water mains and different water main materials that might be contained within the same test section shall be calculated separately and then added together.

$$W = \frac{ND\sqrt{P}}{7400} \quad \textit{WHERE :}$$

W = Allowable leakage in gal/hr.

N = Number of joints in the length of pipeline tested

D = Normal diameter in inches

P = Average test pressure in psi

F. Repairs - During the pressure and leakage test, all accessible appurtenances shall be inspected for visual signs of leakage. All visual leaks shall be corrected immediately, regardless of the amount of leakage and the test shall be run again for its full duration. All leaks detected shall be repaired to a water tight condition. All repairs made shall be retested in accordance with the specifications. All repairs shall be made and a successful test accomplished prior to taking bacteriological samples.

Disinfecting - After completion of testing operations, the Contractor shall sterilize all water mains, services and appurtenances. Sterilization shall be accomplished in accordance with the latest revision of AWWA C-601.

The basic disinfection procedure consists of:

- Preventing contamination materials from entering the water main during storage, construction, or repair.
- Removing, by flushing or other means, those materials that may have entered the water main.
- Chlorinating any residual contamination that may remain, and flushing the chlorinated water from the main.
- Determining the bacteriological quality by laboratory test after disinfection.

Three methods of chlorination are: tablet, continuous feed, and slug. The tablet method is preferred and shall be used unless an alternate method is approved by the Engineering Department.

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A. Tablet Method - The tablet method consists of placing calcium hypochlorite granules and tablets in the water mains as it is being installed and filling the main with potable water when installation is completed.
This method may be used only if the pipes and appurtenances are kept clean and dry during construction.

B. Placing of Calcium Hypochlorite Granules - During construction, calcium hypochlorite granules shall be placed at the upstream end of the first section of pipe, at the upstream end of each branch main, and at 500 foot intervals. The quantity of granules shall be as shown in Table 1.

TABLE 1	
OUNCES OF CALCIUM HYPOCHLORITE GRANULES TO BE PLACED AT BEGINNING OF MAIN AND AT EACH 500-FT	
Pipe Diameter (Inches)	Calcium Hypochlorite Granules (oz.)
4	0.5
6	1.0
8	2.0
12	4.0
16 and Larger	8.0

WARNING: This procedure must not be used on solvent-welded plastic or on screwed-joint pipe because of the danger of fire or explosion from the reaction of the joint compounds with the calcium hypochlorite.

C. Placing of Calcium Hypochlorite Tablets - During construction 5-g calcium hypochlorite tablets shall be placed in each section of the pipe and also one such tablet shall be placed in each hydrant, hydrant branch, and other appurtenances. The number of 5-g tablets required for each pipe section shall be $.0012d^2L$ rounded to the next higher integer, where "d" is the pipe diameter in inches and "L" is the length of pipe section in feet. Table 2 shows the number of tablets required for commonly used sizes of pipe.

TABLE 2 NUMBER OF 5-G CALCIUM HYPOCHLORITE TABLETS REQUIRED FOR DOSE OF 25 MG/L*					
Pipe Diameter (in.)	13 or less	18	20	30	40
Number of 5-g Calcium Hypochlorite Tablets					
4	1	1	1	1	1
6	1	1	1	2	2

NOT FOR CONSTRUCTION

8	1	2	2	3	4
10	2	3	3	4	5
12	3	4	4	6	7
16	4	6	7	10	13
18	5	7	8	12	16

* Based on 3.25g available chlorine per tablet; any portion of tablet rounded to next higher number.

The tablets shall be attached by a food-grade adhesive such as Permatex Form-A-Gasket No. 2 or equal. There shall be no adhesive on the tablet except on the broad side attached to the surface of the pipe. Attach all the tablets inside and at the top of the main, with approximately equal numbers of tablets at each end of a given pipe length. If the tablets are attached before the pipe section is placed in the trench, their position shall be marked on the section so it can be readily determined that the pipe is installed with the tablets at the top

D. Filling and Contact - When tablet installation has been completed, the main shall be filled with water at a rate such that the water within the main will flow at a velocity no greater than 1 ft/s. Precautions shall be taken to assure that air pockets are eliminated. This water shall remain in the pipe for at least twenty-four hours. If the water temperature is less than 41° F (5° C), the water shall remain in the pipe for at least forty-eight hours. Valves shall be positioned so that the strong chlorine solution in the treated main will not flow into water mains in active service.

E. Final Flushing - After the applicable retention period, heavily chlorinated water should not remain in ·prolonged contact with pipe. In order to prevent damage to the pipe lining or corrosion damage to the pipe itself, the heavily chlorinated water shall be flushed from the main until chlorine measurements show that the concentration in the water leaving the main is no higher than that which is generally prevailing in the system or is acceptable for domestic use.

The environment to which the chlorinated water is to be discharged shall be inspected. If there is any question that the chlorinated discharge will cause damage to the environment, then a reducing agent shall be applied to the water to be wasted to neutralize thoroughly the chlorine residual remaining in the water. Where necessary, federal, state, and local regulatory agencies should be contacted to determine special provisions for the disposal of heavily chlorinated water.

F. Bacteriological Tests - After completion of testing and sterilization, prior to final acceptance, the District will take water samples for bacteriological examination. Should any of the samples fail to meet minimum State of California, Department of Public Health requirements, the Contractor will continue to chlorinate and flush the system, as directed, until a satisfactory sample is obtained.

G. Re-disinfection - If the initial disinfection fails to produce satisfactory bacteriological samples, the main may be re-flushed and shall be resampled. If check samples show the presence of coliform organisms, then the main shall be re-chlorinated by the continuous-feed or slug method of chlorination until satisfactory results are obtained.

NOTE: High velocities in the existing system, resulting from flushing the new main, may disturb sediment that has accumulated in the existing mains. When check samples are taken, it is well to also sample water entering the new main.

78-13 SEWER SYSTEM TESTING

NOT FOR CONSTRUCTION

78-13.01 GENERAL

This section governs the testing requirements and procedures for acceptance of all completed sewer lines, manholes, and force mains.

It is the intent of the plans and specifications that the completed sewer pipes along with manholes and other appurtenances shall be watertight.

All sewer pipes shall be air tested for leakage. Gravity sewer mains, including services, shall also be visually inspected by video camera and tested for deflection by a mandrel. Manholes shall be hydrostatically tested for infiltration.

All tests shall be made in the presence of the District.

Even though a section may have previously passed the leakage test, each section of sewer shall be tested subsequent to the last backfill compacting operation if, in the opinion of the District heavy compaction equipment or any of the operations of the contractor or others may have damaged or affected the structural integrity or water-tightness of the pipe, structure, and appurtenances.

OFFICIAL DISTRICT TESTING WILL NOT BE PERMITTED UNTIL AFTER ALL OTHER UTILITIES HAVE BEEN INSTALLED AND THEIR TRENCH COMPACTION VERIFIED.

When lines to be tested are in areas that will be paved, testing shall be done after the rock subgrade is placed and compacted.

Acceptance - The sewer will not be considered acceptable until the leakage or infiltration rate, as determined by test, is less than the maximum allowable.

If the leakage or infiltration rate is greater than the amount specified, the pipe joints shall be repaired or, if necessary, the pipe shall be removed and relayed by the contractors, and retested.

Submittals - The Contractor shall notify the District a minimum of 3 business days in advance of its proposed testing schedule for review and concurrence.

78-13.02 MATERIALS

General - All test equipment, valves, plugs, or other control equipment and materials shall be determined and furnished by the Contractor, subject to the District's review. No materials shall be used which would be injurious to the construction or its future function.

78-13.03 CONSTRUCTION

Mandrel Test for Gravity Sewers - After completion of the sewer line, the line shall be balled and flushed just prior to pulling the mandrel through.

A commercially manufactured, rigid, odd-numbered leg (9 legs minimum) mandrel, with a circular cross section having a diameter of at least 95 percent of the specified average inside diameter, shall be pulled through the pipe by hand. The minimum length of the mandrel shall be equal to the base inside diameter of the pipe. Obstructions encountered by the mandrel shall be corrected by the Contractor.

Air Test for Gravity Sewers - After the mandrel test, each section of sewer between successive manholes shall be air tested as follows:

A. With all outlets plugged, air shall be slowly added until the internal pressure is raised to 4.0 pounds per square inch gage (psig). The compressor used to add air to the pipe shall have a blowoff valve set at *5* psig to ensure that at no time the internal pressure in the pipe exceeds 5 psig.
B. The internal pressure of 4 psig shall be maintained for at least two minutes to allow the air temperature to stabilize, after which the air supply shall be disconnected and the pressure allowed to decrease to 3.5 psig.
C. The time in minutes that is required for the internal air pressure to drop from 3.5 psig to 3.0 psig shall be measured. The results shall not be less than the minimum permissible duration for the air test pressure drop shown in Table I.

TABLE I

NOT FOR CONSTRUCTION

MINIMUM TIME FOR

AIR PRESSURE DROP OF 0.5 PSIG

Time for Length Shown (in Minutes/Seconds)

Pipe Diameter (in.)	0 - 200'	201 - 250'	251 - 300'	301 - 350'	351 - 400'
6	2:50	2:50	2:50	2:50	2:50
8	3:50	3:50	3:50	4:30	5:00
10	4:40	5:00	6:00	7:00	7:50
12	5:40	7:10	8:30	10:00	11:20

D. Should groundwater be present above the flowline of the pipe, the air pressure added to the 3.5 psig criteria shall be calculated by dividing the vertical height, in feet of groundwater above the flowline, by 2.31. The starting test pressure shall not exceed 9.0 psig.
E. If the time shown in Table I for the designated pipe size and length elapses before the air pressure drops 0.5 psig; the section being tested shall have passed and the test discontinued.

Manhole Test - Water tightness of manholes may be tested in connection with tests of sanitary sewers or at the time the manhole is completed and backfilled. The test shall be as follows:

A. The Contractor shall plug all inlets and outlets with approved stoppers or plugs.
B. The manhole shall be filled with water to the top of the frame.
C. The water shall stand in the manhole for a minimum of one hour to allow the manhole material to reach maximum absorption.
D The Contractor shall refill the manhole to the original depth.
E. The time of the test will be determined by the District to fit the various field conditions.
F. The manhole shall be refilled to the original depth and the amount of water required to fill the manhole shall be recorded.
G. If the amount of water added does not exceed the limits shown in Table II, then the manhole has passed the test.

TABLE II

Depth of Manhole (ft).	Allowable Amount of water added (gal.)
0 – 5	1
6 – 7	1 ½
8 – 10	2
11 – 12	2 ½
13 – 15	3
16 – 18	3 ½

NOT FOR CONSTRUCTION

H. Even though the leakage may be less than the specified amount, the Contractor shall stop any leaks that may be observed to the satisfaction of the District.

Video Test - All sewer collectors and laterals shall be T.V. inspected prior to pavement placement in accordance to the following:

A. The complete job.is ready for television inspection when the following work has been completed and approved by the District:
   1. All sewer pipelines are installed, backfilled, and compacted.
   2. All manholes are in place, all channeling is complete and pipelines are accessible from manholes, and testing completed.
   3. All other underground facilities, utility piping and conduits are installed.
   4. Final street subgrading is complete. For wet weather periods, placement of aggregate base has been completed.
   5. Pipelines to be inspected have been cleaned and flushed
   6. Final air test has been completed

B. After the above work is complete, the Contractor shall schedule the video inspection. The video test shall be done in the presence of the District's inspector. Water is to flow through the lines for 12 hours prior to the T.V. work. During the video for service, some water must be flowing for camera orientation. The camera shall have a device to measure depths.
C. If no deficiencies are observed, the work will be considered satisfactory.
D. A videotape will be made .and given to the District, and defects serious enough to require correction will be determined by the District.
E. Notification will be made in writing of any deficiencies revealed by the video that will require repair. If corrective work is indicated and viewing of the videotapes is desired, the District shall be contacted to set a time for the viewing with the Engineer.
F. Corrective work shall be done. District reserves the right to require another test of any repair.
G. Those portions of the pipeline system that have been corrected will be re-televised.
H. The following observations from television inspections will be considered defects in the construction of sewer pipelines and will require correction prior to paving:
   1. Low spots, 1/2-inch and greater
   2. Joint separations
   3. Cocked joints present in straight runs or on the wrong side of pipe curves
   4. Cracked or damaged pipe
   5. Dropped joints
   6. Infiltration
   7. Debris or other foreign objects
   8. Other obvious deficiencies
   9. Irregular condition without logical explanation
   10. Standing water in service laterals

Sewer Force Main Test - Leakage test for sewer force mains shall follow the procedures set forth in Section 78-12"Testing and Disinfecting Water Mains" Subsection 3.2.

All defective elements shall be repaired, or removed and replaced, and then re-tested until all visible leakage has been stopped and the allowable leakage requirements have been met.

78-14 ABANDONMENT OF FACILITIES

78-14.01 GENERAL

This section governs abandonment of pipelines, manholes, vaults, and other existing structures.

NOT FOR CONSTRUCTION

Submittals - Upon request, schedules and method of abandonment shall be submitted to the District for approval.

78-14.02 MATERIALS

General - Concrete, fittings, backfill material and other material used for abandonment shall comply with District Technical Specifications.

78-14.03 CONSTRUCTION

Pipelines - Pipelines are to be abandoned by either plugging the ends or filling the entire pipeline with pumped concrete.

Pipelines to be abandoned, shall be securely closed at all pipe ends by an approved cap or, at manhole entries, by a watertight plug of concrete, or brick and cement mortar, not less than 2 feet thick. When laterals are abandoned, they shall be capped with an approved fitting at the property line.

Pipelines to be completely filled shall be pumped full with a concrete mix sufficiently workable for the purposes intended.

Structures - Structures to be abandoned shall have all openings, inlets and outlets sealed off and the structure shall be removed to a point 3 feet below the proposed street grade or ground surface and filled

Salvaged Materials - Salvaged castings such as frames and covers and other appurtenances, unless otherwise specified, shall be delivered to a District facility prearranged with the Maintenance' Supervisor.

78-15 CONCRETE AND REINFORCING STEEL

78-15.01 GENERAL

This specification includes concrete materials, mixing, placement, formwork, reinforcement and curing.

Submittals - Prior to placement, the following shall be submitted:

A. Supplier's concrete mix data sheet showing contents and proportions of cement, aggregate, water, and any admixtures.
B. Reinforcing steel schedule, if requested.

78-15.02 MATERIALS

Concrete - Portland cement concrete shall be composed of Portland cement, fine aggregate, coarse aggregate, admixtures if used, and water, proportioned and mixed as specified in the Caltrans Standard Specifications Section 90, "Portland Cement Concrete".

Concrete for each portion of the work shall be of the class as shown below, for the type of work performed.

Caltrans Class	Type of Work	Max. Slump (inches)
A	All reinforced structures, manhole bases, piers, vaults	4
B	Anchors, thrust blocks, encasements, cradles, and miscellaneous unreinforced concrete	4

Maximum water/cement ratio to be 0.55

Rapid setting concrete may be used. Accelerating admixtures may be added to the concrete mix as approved by the District.

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Grout - Grout shall be composed of 1 part Type II Portland Cement to 1112 parts sand. The sand shall be washed, well-graded sand such that all will pass a No. 8 sieve. Water shall be clean potable water. The quantity of water to be used in the preparation of grout shall be the minimum required to produce a mixture sufficiently workable for the purpose intended. Grout shall attain a minimum compressive strength of 2,000 psi in 28 days.

Rapid setting, non-shrink, "5-minute" grout may be used or required in certain circumstances as approved by the District.

Reinforcing Steel - Reinforcing steel shall conform to ASTM A 615, Grade 60. Reinforcing steel shall be fabricated in accordance with the current edition of the Manual of Standard Practice, published by the Concrete Reinforcing Steel Institute. Reinforcing steel shall be delivered to the site bundled and tagged for identification.

Tie Wire - Tie wire shall be 16 gage minimum, black, soft annealed.

Bar Supports - Bar supports in beams and slabs exposed to view after form· stripping shall be galvanized or plastic coated. Concrete supports shall be used for reinforcing concrete placed on grade.

Forms - Forms shall be accurately constructed of clean lumber and shall be braced to provide sufficient strength and rigidity to hold the concrete and to withstand the necessary pressure and consolidation without deflection from the prescribed lines.

The surface of forms against which concrete is placed shall be smooth and free from irregularities, dents, sags, or holes. The surface shall leave uniform form marks conforming to the general lines of the structure.

78-15.03 CONSTRUCTION

Formwork - The Contractor shall notify the District a minimum of one working day before his intended placement of concrete to enable the District to check the form lines, grades, and other required items before placement of concrete.

Unless otherwise indicated on the plans, all exposed sharp concrete edges shall be 3 –inch chamfered.

Before placing concrete, the form surface shall be clean and coated with form oil of high penetrating qualities where applicable.

Reinforcement - Reinforcing steel shall be placed in accordance with the current edition of Recommended Practice for Placing Reinforcing Bars, published by the Concrete Reinforcing Steel Institute.

All reinforcing steel shall be of the required sizes and shapes and placed where shown on the drawings.

Reinforcing steel shall not be straightened or re-bent in a manner that will damage the material. The Contractor shall not use bars with bends not shown on the drawings. ALL STEEL SHALL BE COLD BENT - DO NOT USE HEAT.

All bars shall be free from rust, scale, oil, or any other coating which would reduce or destroy the bond between concrete and steel.

Reinforcement steel shall be positioned in accordance with the drawings and secured by using annealed wire tires or clips at intersections and supported by concrete or metal supports, spacers, or metal hangers. Tie wires shall be bent away from the forms in order to provide the specified concrete coverage. Bars, additional to those shown on the drawings,, which may be found necessary or desirable by the District for the purpose of securing reinforcement in position, shall be provided.

All reinforcing steel and wire mesh shall be completely encased in concrete. Reinforcement shall be placed a minimum of 2-inches clear of any metal pipe or fittings. The reinforcement shall be so secured in position that it will not be displaced during the placement of concrete.

Reinforcing dowels shall be secured in place prior to placing concrete. The Contractor shall not press dowels into the concrete after the concrete has been placed. The minimum lap for all reinforcement shall

NOT FOR CONSTRUCTION

be 40 bar diameters. Additional reinforcement shall be placed around the pipe or openings as indicated in the drawings.

Wire mesh reinforcement is to be rolled flat before being placed in the form. The Contractor shall support and tie wire mesh to prevent movement during concrete placement. Welded wire fabric shall be extended to within 2 inches of the edges of the slab. Splices shall be lapped at least l *1h* courses of the fabric and a minimum of 6 inches. Laps and splices shall be securely tied at ends and at least every 24 inches with 16-gage black annealed steel wire. The Contractor shall pull the fabric into position as the concrete is placed by means of hooks, and then work concrete under the steel to ensure that it is at the proper distance above the bottom of the slab.

Embedded Items - All embedded bolts, dowels, anchors and other embedded items shall be held correctly in place in the forms before concrete is placed.

Mixing and Placing Concrete - Concrete, either ready mix or batch mixed, shall be placed in the forms before taking its initial set. No concrete shall be placed in water except with approval of the District.

As the concrete is placed in the forms, or in excavations to be filled with concrete, it shall be thoroughly settled and compacted throughout the entire layer by internal vibration and tamping bars. Concrete shall not be permitted to fall more than 6 feet and shall be deposited as nearly as practicable to its final position.

All concrete surfaces upon which or against which the concrete is to be placed, and to which new concrete is to adhere, shall be roughened, thoroughly cleaned, wet or sandblasted to bare aggregate as directed. An approved bonding agent shall be used before the concrete is deposited.

Concrete Finishing - Immediately upon the removal of forms, all voids shall be neatly filled with cement mortar.

The surfaces of concrete to be permanently exposed to view shall be smooth, free from projections, and thoroughly filled with mortar.

Exposed surfaces of concrete not finished against forms, such as horizontal or sloping surfaces, shall be screened to a uniform surface and worked with suitable tools to a light broom finish.

Protection and Curing of Concrete - The Contractor shall protect all concrete against damage. Exposed surfaces of new concrete shall be protected from the direct rays of the sun and from frost by being kept damp for at least two weeks after the concrete has been placed, or by using an approved curing process.

78-16 PRECAST CONCRETE VAULTS

78-16.01 GENERAL

The work covered by this section shall consist of furnishing all materials, accessories, equipment, tools, transportation, service, labor and performing all operations to furnish and install the precast concrete vaults, including concrete pads, in accordance with this section of the specifications and applicable drawings. Excavation and backfill to be in accordance with Section 78-1.

Precast concrete vaults and covers shall be manufactured in a plant especially designed for that purpose and shall conform to the shapes and dimensions indicated on the plans.

Submittals - Prior to installation the following is to be submitted:

A. Submit manufacturer's catalog data on precast items. Show dimensions of vault, thickness of walls, and top slab. Show reinforcing. Show materials of construction by ASTM reference and grade.

Design Loads - Design loads shall consist of dead load, live load, impact, and, in addition, loads due to water table and any other loads which may be imposed upon the structure. Live loads shall be for HS-20 per AASHTO standard specifications for highway bridges. Design wheel load shall be 16 kips. The live load shall be that which produces the maximum shears and bending moments in the structure. Minimum wall thickness shall be 6 inches.

NOT FOR CONSTRUCTION

78-16.02 MATERIALS

Concrete - Portland cement concrete shall conform to Class A as specified in the Caltrans Standard Specifications Section 90, "Portland Cement Concrete."

Reinforcement - Reinforcement shall be deformed reinforcement in accordance with ASTM A615 or ASTM A497 for welded deformed wire fabric.

Joint Sealing Compound - Joint sealing compound shall be impermeable to water; have high bonding strength to steel, concrete, etc., maintain permanent plasticity; resistant to applicable chemical exposure; and complies with the applicable Federal Specifications .

Access Door - Access doors shall be Type JD-AL as manufactured by the Bilco Company, New Haven, Conn., or equal.

Vents - Vents shall be constructed from 6-inch C-900 PVC pipe and fittings. Fittings shall be socket-welded type.

Each vault shall have 2 vents, one upper and one lower.

Install 304 stainless steel insect screen over vent openings above ground.

78-16.03 CONSTRUCTION

Installation - Openings or "knockouts" in precast concrete vaults shall be located as shown on the drawings and shall be sized sufficiently to permit passage of the largest dimension of pipe and/or flange. Upon completion of installation, all voids or openings in the vault walls around pipes shall be filled with 3,000 psi non-shrink grout.

All joints between precast concrete vault sections shall be made watertight. The joint sealing compound shall be installed according to the manufacturer's recommendations to provide a watertight joint, which remains impermeable throughout the design life of the structure.

Access doors shall be built up so that the hatch is flush with the surrounding surface unless otherwise specified on the drawings or by the District. The Contractor is responsible for placing the cover at the proper elevation where paving is to be installed and shall make all necessary adjustments so that the cover meets these requirements.

The vault floor shall contain an 18-inch diameter hole for installation of a gravity drain or sump. The vault floor shall be constructed so that there is a positive slope to the sump.

Exterior Coating - All exterior surfaces shall be coated with a minimum 30 mil (wft) of bitumastic 30 mil.

78-17 PAINTING AND COATING

78-17.01 GENERAL

This section governs materials and application of painting and coating for exposed pipe and appurtenances.

Submittals - Prior to application, the following shall be submitted:

Paint or coating manufacturer's product data sheet showing suitability of material for intended use including instruction on surface preparation and application.

Color Schedule - Above-ground or exposed facilities shall be color coded to differentiate from potable water, reclaimed water, and wastewater facilities as follows:

Potable Water:	Medium Blue
Reclaimed Water:	OSHA Safety Purple
Wastewater:	OSHA Safety Green

NOT FOR CONSTRUCTION

78-17.02 MATERIALS

Alkyd Primer - All primer shall be lead free and rust-inhibitive synthetic-alkyd based. It shall be designed for use with an alkyd enamel finish coat.

Alkyd Enamel - Enamel shall be a high gloss industrial type, lead free, synthetic-alkyd based, intended for use on exterior metal surfaces.

Bituminous Mastic - Bituminous mastic shall be coal-tar pitch based and shall have a minimum of 68% solids by volume.

Epoxy Paint - Epoxy shall be a colored polyamide cured epoxy with not less than 49% solids by volume.

All coatings and pigments to be used on potable water services shall have FDA approval for use with potable water.

78-17.03 CONSTRUCTION

General - The requirements for painting and coating ferrous surfaces shall generally conform to the SSPC (Steel Structures Painting Council) and to the manufacturer's recommendations. Application of the paint or coating system shall not be permitted if, in the opinion of the District, the equipment, climate, or safety conditions do meet the above recommendations.

The Contractor shall stir, strain, and keep coating materials at a uniform consistency during application. Each coating shall be applied evenly, free of brush marks, sags, runs and other evidence of poor workmanship. Finished surfaces shall be free from defects and blemishes.

The Contractor shall not use thinners unless permitted by the District. If thinning is allowed, the maximum allowable amount of thinner per gallon of coating material as recommended by the manufacturer shall be used. Coating materials shall be stirred at all times when adding thinner and the coating material surface shall not be flooded with thinner prior to mixing. The Contractor shall not reduce coating materials more than is absolutely necessary to obtain the proper application characteristics and to obtain the specified dry film thickness.

Deliver all paints to the job site in the original, unopened containers.

Surfaces not to be Coated - The following surfaces shall not be painted and shall be protected during the painting of adjacent areas:

A. Mortar-coated pipe and fittings
B. Concrete surfaces (i.e. vaults)
C. Stainless steel
D. Anodized aluminum
E. Nameplates
F. Manhole frames and covers
G. Grease fittings
H. Glass
I. Brass, copper or bronze
J. Platform gratings
K. Buried pipe, unless specifically required in the piping specifications

Surface Preparation - The Contractor shall not prepare more surface area than can be coated in one day. Pipe that has already been factory primed or painted shall not be sandblasted. All surfaces shall be prepared in accordance with the manufacturer's recommendations.

Wherever the words "solvent cleaning", "hand tool cleaning", "wire brushing", or "blast cleaning", or similar words are used in these specifications or in paint manufacturer's specifications, they shall be understood to refer to the applicable SSPC (Steel Structure Painting Council).

NOT FOR CONSTRUCTION

Shop Applied Primer - Surfaces that are shop primed shall receive a field touchup of primer to cover all scratches or abraded areas.

Alkyd Enamel - All above-ground or exposed piping, fire hydrants, and exposed metalwork shall be painted using an alkyd system.

A. Surface Preparation:
   1. All rust, mill scale, or weld splatter shall be removed by sandblasting or power tool cleaning.
   2. All unpainted surfaces shall be solvent cleaned.
   3. All abraded or scratched enamel coatings shall be sanded smooth or receive power tool cleaning.
   4. All failures in the existing coating shall be sandblasted.
   5. All existing surfaces to be repainted shall be washed with TSP and stiff bristle brush.

B. Primer - All unpainted or damaged surfaces shall be coated with primer to a dry-film thickness or not less than 2 mils.
C. Finish Coat - The finish coats shall be two or more coats of alkyd enamel applied to a dry-film thickness of 3 mils, providing a total painted dry film thickness of not less than *5* mils.

Bituminous Mastic - Buried metal (flanges, non-stainless steel nuts and bolts, flexible couplings, exposed reinforcing steel, etc.) shall be coated with a minimum of 20 mils of bituminous mastic.

All surfaces coated with bituminous mastic shall be covered with 8 mil polyethylene wrap.

Epoxy Coating - Only those metal surfaces specifically called out, shall be epoxy coated and applied as follows:

A. Surfaces to be epoxy coated shall be sandblasted.
B. Sandblasted surfaces shall be coated with primer to a dry film thickness of 3 mils.
C. Two coats of epoxy paint shall be applied (4 mils each) to the primed surface. The manufacturer's recommended drying time between coats shall be followed.
D. The Contractor shall prepare multiple-component coatings using all of the contents of the container for each component as packaged by the paint manufacturer. Partial batches and multiple component coatings that have been mixed beyond their pot life shall not be used. Touchup paint shall be provided. The Contractor shall mix only the components specified and furnished by the paint manufacturer. The Contractor shall not intermix additional components for reasons of color or otherwise, even within the same generic type of coating.

Application Limitation - Paint or coating shall not be applied under the following conditions:

A. When the surrounding air temperature or the temperature of the surface to be coated is below 40° F or as recommended by the manufacturer of the specified coating system.
B. When the temperature of the surface to be coated is more than 5° F below the air temperature or when the surface temperature is over 120° F.
C. When the surface to be coated is wet, moist, or contaminated with any foreign matter.
D. During rain, fog, or mist, or when the relative humidity exceeds 80 percent.
E. When the temperature is less than 5° F above the dewpoint.

If above conditions are prevalent, the application of coating shall be delayed or postponed until conditions are favorable. Dew or moisture condensation should be anticipated and if such conditions are prevalent, coating work shall be delayed until mid-morning to be certain that the surfaces are dry. The day's coating shall be completed in time to permit the film sufficient drying time prior to damage by climatic conditions.

If a change in climatic conditions damages a coating application, the Contractor shall repair the damaged coating to its specified condition as directed by the District.

Paint shall be applied in such a manner as to assure an even, smooth, uniform adhering coat free from dirt, runs, brush marks and laps, and shall be applied as recommended by the manufacturer. Paint shall not be applied when freshly painted

NOT FOR CONSTRUCTION

surfaces can become damaged by rain, fog, or condensation or when inclement weather can be anticipated. Fresh paint damaged by the elements shall be replaced by the contractor at his expense. Drop cloths shall be used to protect floors, equipment, piping and other exposed surfaces from spattering and spillage. Paint shall be allowed to dry thoroughly between applications of successive coats. The manufacturer's recommended time between coats will be used as a guide by the District as to when the next coat of paint may be applied. The District must give approval before successive coats are applied.

The Contractor shall notify the District after surface preparation and after the application of each coat of paint.

78-17.04 TESTING

General - The District will perform such tests as are required to ensure compliance with all phases of the work including surface preparation, abrasive blast cleaning, and the application of the coating systems.

If the item has an improper finish color or insufficient film thickness, the surface shall be cleaned and top coated with the specified paint material to obtain the specified color and coverage. Visible areas of chipped, peeled, or abraded paint shall be hand or power-sanded, feathering the edges. The areas shall then be primed and finish coated in accordance with the specifications. Work shall be free of runs, bridges, shiners, laps, or other imperfections.

78-18 STEEL PIPE CASING

78-18.01 GENERAL

This specification governs the furnishing and installing of casing pipe to a true line and grade as shown on the plans. All incidentals and appurtenant operations necessary for the construction of the casing and pipe shall be done in strict accordance with the drawings, applicable permits, and other items and conditions of the contract. Should there be conflicts between this specification and the governing agency, the more restrictive condition shall apply.

The Contractor shall furnish all equipment, tools, labor and materials required for the construction as shown and specified.

All standard specifications; i.e., ASTM, etc., made a portion of these specifications by reference shall be the latest edition and revision thereof. The Contractor shall be responsible for all material furnished by him and shall replace at his own expense, should the material be defective in manufacture or damaged in delivery. This shall include the furnishing of all material and labor required to replace defective material discovered prior to final acceptance of the work.

Submittals - Submittals shall be provided for the following items:

1. Casing, size, thickness, and material
2. Construction method
3. Skid configuration

Permits - All work shall conform to the specifications and requirements of the agency having jurisdiction. The Contractor shall secure all required permits for construction of casing pipe installation.

Safety - It shall be the Contractor's responsibility to see that the work is done in conformance with CAL-OSHA and all other applicable laws and regulations.

78-18.02 MATERIALS

A. Casing - Steel casing pipe shall conform, as a minimum, to ASTM A283, Grade C. All casing is required to be either straight seam or seamless steel. Used pipe for casing shall be allowed if it meets the same specifications as new pipe that is used for casing.

Minimum wall thickness for steel pipe casing shall be as shown on the table that follows the casing specifications. However, in no case shall wall thickness be less than 1/4-inch.

NOT FOR CONSTRUCTION

Lap weld or corrugated pipe, shall not be used.

1. Tolerances for Casing - The outside diameter (O.D.) shall be as follows:

4-1/2 inches O.D. through 18 inches O.D.	±0.75%
20 inches O.D. and larger	±1.00%

For casing, maximum variation within above tolerances between maximum and minimum outside diameter shall not exceed 1/4-inch from 6 inches to 48 inches and Yi-inch over 54 inches.

The wall thickness at any and all places on steel casing shall be as follows:

4 inches through 18 inches	+15.0%	-12.0%
20 inches and larger	+17.5%	-10.0%

2. Lengths and Ends - Unless otherwise agreed, the casing shall be square cut by mechanical methods. Torches held by machinery shall be considered to meet this requirement. The lengths shall be even multiples of IO feet (i.e., IO feet, 20 feet, 30 feet, 40 feet, etc.) unless otherwise specified by the boring Contractor. This does not apply to field cutting.

3. Straightness - Casing shall be measured by the cord method with either string or wire stretched taut to take out all visible sag. Maximum cord measured along the casing shall be true length x 0.02%. This shall be measured on actual lengths before loading for delivery to the jobsite.

4. Minimum Wall Thickness for Casing – If not shown on the plans, the minimum wall thickness shall be as follows:

Casing Size	0 to 100' Length	100' to 200' Length
16" - 18"	1/4"	3/8"
20" - 26"	5/16"	5/16"
28" - 32"	3/8"	3/8"

5. Grout Ports - For casing sizes 30 inches and larger, inside grout ports shall be provided. Location and frequency of the ports shall be approved by the Engineer.

B. Grout - Grout shall consist of one part Portland cement, water, and four parts sand. Sand shall be of a fineness that 100 percent passes a standard 8-mesh sieve and at least 45 percent, by weight, passes the 40-mesh sieve.

C. Skids - Skids shall be pressure treated fir, heart redwood, or polyurethane. Skid straps shall be stainless steel.

D. Backfill - The void between the earner pipe and casing shall be filled with blown sand or grout as shown on the plans.

78-18.03 CONSTRUCTION

A. Alignment and Grade - Where tolerances are not shown on the plans, the horizontal tolerance for pressure and gravity pipeline shall be 1 percent left or right, from the survey line. Vertical tolerance for pressure pipelines shall be 1 percent up or down from the grade line. No vertical tolerance is allowed for gravity flow pipelines.

B. Backfill - The annular space between the carrier pipe and the jacked casing shall be filled with air blown sand.

C. Sealing Ends of the Casing – The annular spaces at the ends of the casing shall be sealed with Class B concrete a minimum of 6 inches thick or brick and mortar.

NOT FOR CONSTRUCTION

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80 FENCES

Replace "medium or dark green" in the 1st paragraph of section 80-3.02C with:

black

Replace "Class A coating" in the 1st paragraph of section 80-3.02C with:

Class B coating

Replace "Reserved" in section 80-4 with:

80-4 SUBSTATION FENCE

80-4.01 GENERAL

Section 80-4 includes specifications for constructing substation fence as shown.

Substation fence shall match existing as closely as possible.

80-4.02 MATERIALS

80-4.02A General

Galvanize all materials. Do not use materials imperfectly galvanized or with serious abrasions.

Concrete must have a minimum compressive strength of 2500 psi at 28 days.

Barbed wire must

1. comply with ASTM A121 Class I,
2. consist of two strands of 12-1/2 gage wire,
3. twisted with 4 point, 14 gage barbs spaced at 6" O.C.

80-4.02B Posts and Braces

Steel pipe used for posts, braces and gate frames must comply with ASTM A120.

Structural and rolled formed shapes must be ASTM A36, Hot Dipped Galvanized per ASTM A123 of galvanized coating.

The size and weight of each post and braces must be as shown.

Each post must have provisions to securely hold the top tension wire in position and allow for post removal and replacement without damaging the wire. Fit each tubular post with a rainproof top.

Extensions arms must carry and anchor securely three (3) rows of barbed wire equally spaced, and support a vertical load of 200 pounds at the outer end.

80-4.02C Fabric

Chain link fabric must have twisted and barbed selvage on top and knuckled selvage on the bottom. Fabric must be coated with either:

1. zinc conforming to ASTM A392, with a Class I coating
2. aluminum conforming to ASTM A491(2) or
3. plastic,
   a. thermally extruded over zinc-coated steel, wire or aluminum-coated steel wire or
   b. thermally bonded over plastic primed steel wire at manufacturer's option.

NOT FOR CONSTRUCTION

The wire for the fabric must be 9 gage. The size of the mesh must be 2-inch.

80-4.02D Tension Wires, Hog Rings, Turnbuckles, Truss Tighteners, Truss Rods, and Stretcher Bars and Bar Bands.

Hardware, except tie wire and barbed wire, must comply with ASTM A153 for galvanized coating.

Tension wire must be commercial quality 7-gage coil spring steel.

Tie wires and hog rings must be at least 9-gage steel.

Post clips must be at least 6-gage steel.

Galvanize tension and tie wires, hog rings, and post clips under ASTM A 116, coating Class 3.

80-4.03 CONSTRUCTION

Stretch chain link fabric and securely fasten to the posts. Fabric must be fastened to rails and top and bottom tension wire with tie wires, hog rings or metal bands.

Fasten the fabric to end, corner and gate posts with 1/4"x3/4" stretcher bars and not less than 1/8"x3/4" stretch bar bands unless 3-1/2"x3-1/2" roll formed terminals with integral lock loop for attaching fabric are used.

Install Barbed wire on extension arms. Each wire must be pulled taut. Wire must be attached to end, corner, and gate posts with wire stretching bands.

Changes in line where the angle of deflection exceeds 30 degrees are considered a corner and corner posts must be installed.

80-4.04 PAYMENT

Not Used

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DIVISION IX TRAFFIC CONTROL FACILITIES

83 RAILINGS AND BARRIERS

Add to section 83-1.01:

Construct barrier mounted Iron railing as shown and under section 83-1.02D.

^^

86 ELECTRICAL SYSTEMS

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.

NOT FOR CONSTRUCTION

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.

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.

NOT FOR CONSTRUCTION

Replace the 1st paragraph in section 86-8.01 with:

Payment for the pull box is included in the payment for the minor concrete (curb, gutter, and sidewalk).

^^

DIVISION X MATERIALS

90 CONCRETE

Add to section 90-1.02I(2)(a):

For concrete at Hangtown Creek Bridge, 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 90-1.02I(2)(b):

Concrete at deck slabs, concrete barrier, curb gutter and sidewalk is exposed to deicing chemicals.

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 alkalies as Na_2O equivalent	3.0 max

Physical property	Requirement
Particle size distribution Less than 45 microns Less than 10 microns	 95 percent 50 percent
Strength activity index with portland cement[b] 7 days 28 days	 95 percent (min percent of control) 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

[a]SiO_2 in crystalline form must not exceed 1.0 percent.
[b]When tested under AASHTO M 307 for strength activity testing of silica fume.
[c]In the test mix, Type II or V portland cement must be replaced with at least 12 percent rice hull ash by weight.

For the purpose of calculating the equations for the cementitious material specifications, consider rice hull ash to be represented by the variable *UF*.

NOT FOR CONSTRUCTION

REVISED STANDARD SPECIFICATIONS
APPLICABLE TO THE 2010 EDITION
OF THE STANDARD SPECIFICATIONS

NOT FOR CONSTRUCTION

REVISED STANDARD SPECIFICATIONS
DATED11-15-13

ORGANIZATION

Revised standard specifications are under headings that correspond with the main-section headings of the *Standard Specifications*. A main-section heading is a heading shown in the table of contents of the *Standard Specifications*. A date under a main-section heading is the date of the latest revision to the section.

Each revision to the *Standard Specifications* begins with a revision clause that describes or introduces a revision to the *Standard Specifications*. For a revision clause that describes a revision, the date on the right above the clause is the publication date of the revision. For a revision clause that introduces a revision, the date on the right above a revised term, phrase, clause, paragraph, or section is the publication date of the revised term, phrase, clause, paragraph, or section. For a multiple-paragraph or multiple-section revision, the date on the right above a paragraph or section is the publication date of the paragraphs or sections that follow.

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

^^

ORGANIZATIONAL REVISIONS

07-19-13

Transfer section 36 from division IV to division V.

^^

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.

NOT FOR CONSTRUCTION

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

^^

11 QUALITY CONTROL AND ASSURANCE

07-19-13

Replace section 11-2 with:

07-19-13

11-2 RESERVED

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

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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.

^^

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:

10-19-12

work

Add after "Display" in item 4 in the list in the 2nd paragraph of section 12-3.03B:

04-19-13

or Alternating Diamond

Replace "project" in the 3rd paragraph of section 12-3.07C with:

10-19-12

work

NOT FOR CONSTRUCTION

Add to section 12-3:

07-19-13

12-3.18 AUTOMATED WORK ZONE INFORMATION SYSTEM

Reserved

12-3.19–12-3.25 RESERVED

Replace the 7th through 9th paragraphs of section 12-4.02A with:

07-19-13

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.

Replace section 12-4.03 with:

07-19-13

12-4.03 CLOSURE SCHEDULES AND CONDITIONS

12-4.03A General

Submit closure schedule requests and closure schedule amendments using LCS to show the locations and times of the requested closures.

The Department provides LCS training. Request the LCS training at least 30 days before submitting the 1st lane closure request. The Department provides the training within 15 days after your request. The training may be web based.

Except for web-based training, the training is held at a time and location you and the Engineer agree to.

For web-based training, the Engineer provides you the website address to access the training.

Within 5 business days after completion of the training, the Department provides LCS accounts and user identifications to your assigned, trained representatives.

Each representative must maintain a unique password and current user information in the LCS.

12-4.03B Closure Schedules

Every Monday by noon, submit a closure schedule request of planned closures for the next week period. The next week period is defined as Sunday noon through the following Sunday noon.

Submit a closure schedule request not less than 25 days and not more than 125 days before the anticipated start of any activity that reduces:

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

NOT FOR CONSTRUCTION

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

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

You will be notified through LCS of unauthorized closures or closures that require coordination with other parties as a condition for authorization.

The Engineer may reschedule a closure cancelled due to unsuitable weather.

If a closure is not opened to traffic by the specified time, suspend work. No further closures are allowed until the Engineer has reviewed and authorized a work plan submitted by you that ensures that future closures will be opened to traffic by the specified time. Allow 2 business days for review of your proposed work plan. The Department does not compensate you for your losses due to the suspension of work resulting from the late opening of closures.

Notify the Engineer of delays in your activities caused by:

1. Your closure schedule request being denied although your requested closures are within the specified time frame allowed for closures. The Department does not compensate you for your losses due to amendments to the closure schedule that are not authorized.
2. Your authorized closure being denied.

If you are directed to remove a closure before the time designated in the authorized closure schedule, you will be compensated for the delay.

12-4.03C Contingency Plan

Section 12-4.03C applies if a contingency plan is specified in the special provisions or if a contingency plan is requested.

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

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

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

Based on the Engineer's review, additional materials, equipment, workers, or time to complete activities from that specified in the contingency plan may be required.

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

NOT FOR CONSTRUCTION

Replace section 12-7 with:

07-19-13

12-7 TEMPORARY PEDESTRIAN FACILITIES

12-7.01 GENERAL

Section 12-7 includes specifications for constructing temporary pedestrian facilities.

Temporary pedestrian facilities must comply with the *California MUTCD*, Part 6, Chapter 6D, "Pedestrian and Worker Safety."

Design temporary pedestrian facilities with protective overhead covering to support all imposed loads.

The design load and maximum allowable stresses for temporary pedestrian facilities with protective overhead covering must comply with section 48-2.01D(3). The minimum design live load for the temporary pedestrian facilities with protective overhead covering must be 150 psf for the entire structure.

The minimum width of the temporary pedestrian facilities with protective overhead covering between the inside face of handrails must be 60 inches. The clear height of the temporary pedestrian facilities with protective overhead covering measured from the floor surface to the canopy overhead must be at least 8 feet. Provide adequate lighting at all times. Lighting must comply with section 86-6.13.

Submit shop drawings with supporting calculations for temporary pedestrian facilities with protective overhead covering. Shop drawings and calculations must be signed by an engineer who is registered as a civil engineer in the State.

12-7.02 MATERIALS

Walkways must be surfaced with HMA, portland cement concrete, or wood. The surface must be skid resistant and free of irregularities.

Hand railings must be S4S lumber and painted white.

Protective overhead covering of temporary pedestrian facilities must be plywood at least 3/4 inch thick or wood planking with a nominal thickness of 2 inches minimum.

12-7.03 CONSTRUCTION

Construct hand railings on each side of a temporary pedestrian facility as necessary to protect pedestrian traffic from hazards due to work activities or adjacent vehicular traffic.

Maintain temporary pedestrian facilities in good condition and keep them clear of obstructions.

12-7.04 PAYMENT

Not Used

^^

13 WATER POLLUTION CONTROL

11-15-13

04-19-13

Delete item 3 in the list in the 4th paragraph of section 13-1.01A.

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

NOT FOR CONSTRUCTION

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

NOT FOR CONSTRUCTION

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

04-19-13

Delete the 1st sentence in the 2nd paragraph of section 13-4.03C(3).

Add between the 2nd and 3rd paragraphs of section 13-4.03C(3):

04-19-13

Manage stockpiles by implementing water pollution control practices on:

1. Active stockpiles before a forecasted storm event
2. Inactive stockpiles according to the WPCP or SWPPP schedule

Replace the paragraph in section 13-4.04 with:

04-20-12

Not Used

NOT FOR CONSTRUCTION

Replace "20-7.02D(6)" in section 13-5.02C with:

07-19-13

20-5.03E

10-19-12

Delete "or stockpile" in the 3rd paragraph of section 13-5.02F.

Replace "20-7.03I(10)" in section 13-5.03C with:

07-19-13

20-5.03E(3)

Replace section 13-5.03F with:

04-20-12

13-5.03F Reserved

10-19-12

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.

Replace the 2nd sentence in the 1st paragraph of section 13-9.01A with:

10-19-12

You may use any of the following systems for temporary concrete washout:

1. Temporary concrete washout facility
2. Portable temporary concrete washout
3. Temporary concrete washout bin

Replace the 2nd paragraph of section 13-9.01B with:

10-19-12

Retain and submit an informational submittal for records of disposed concrete waste.

10-19-12

Delete the 4th paragraph of section 13-9.01B.

10-19-12

Delete "if authorized" in the 1st sentence in the 1st paragraph of section 13-9.02A.

Replace "at least 3-inch" in the 3rd sentence in the 1st paragraph of section 13-9.02A with:

10-19-12

6-inch

NOT FOR CONSTRUCTION

^^

15 EXISTING FACILITIES

07-19-13

Replace section 15-1.03D with:

07-19-13

15-1.03D Reserved

Replace "metal beam guard railing" in the 1st paragraph of section 15-2.01C with:

07-19-13

guardrail

Replace the paragraphs of section 15-2.02B(1) with:

07-19-13

Section 15-2.02B includes specifications for removing pavement, base, subbase, and subgrade.

If only a portion of the pavement is removed, saw-cut the outline of the removal area on a neat line and with a power-driven saw before removing.

For asphalt concrete pavement, saw cuts must be at least 2 inches deep unless otherwise described.

Replace section 15-2.02B(4)(b) with:

07-19-13

15-2.02B(4)(b) Reserved

Add to section 15-2.02B:

07-19-13

15-2.02B(5) Remove Concrete Pavement

15-2.02B(5)(a) General

Remove only the portion of pavement to be replaced or repaired during the same lane closure. If there is overlying material on the concrete pavement, remove it with the pavement.

Do not impact the surface within 18 inches of the pavement to remain in place. Use removal methods that do not damage the remaining pavement and base. Slab-lifting equipment must attach to the pavement.

Instead of disposing of removed concrete pavement by removing it from the job site, you may dispose of it under section 15-3.01.

15-2.02B(5)(b) Saw Cuts

Saw cut using a diamond blade and make cuts perpendicular to the pavement surface. Saw cutting is not required where concrete pavement is adjacent to asphalt concrete pavement.

Saw cut (1) no more than 2 days before removing pavement and (2) such that traffic will not dislodge any pavement piece or segment. Saw cut perpendicular to the traveled way except you may cut parallel or diagonal to the traveled way when removing the pavement during the same lane closure as the saw cutting.

You may make additional saw cuts within the sawed outline.

Saw cuts must be the full depth of the pavement unless otherwise shown.

Saw cut at longitudinal and transverse joints to remove entire slabs. For partial-slab areas, the Engineer determines the exact saw-cut locations.

NOT FOR CONSTRUCTION

15-2.02B(5)(c) Reserved

15-2.02B(6) Reserved

15-2.02B(7) Payment

Reserved

Replace section 15-2.02G with:

07-19-13

15-2.02G Remove Guardrail

Where removing guardrail, remove any concrete anchors and steel foundation tubes.

Replace the 1st paragraph of section 15-2.02K with:

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:

07-19-13

Guardrail

Replace the heading of section 15-2.03B with:

07-19-13

Salvage Guardrail

Replace the heading of section 15-2.04D with:

07-19-13

Reconstruct Guardrail

Replace section 15-2.09D with:

07-19-13

15-2.09D Reserved

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

NOT FOR CONSTRUCTION

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

07-19-13

Delete the 5th paragraph of section 15-3.03.

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.

NOT FOR CONSTRUCTION

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.

04-19-13

Delete "and concrete expansion dams" in the 3rd paragraph of section 15-5.01C(4).

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.

10-19-12

Delete the 4th paragraph of section 15-5.05C.

Replace "51-1.03F(5)" in the 3rd paragraph of section 15-5.06C(1) with:

07-19-13

51-1.01D(4)(b)

Replace "51-1.03E(5)" in the 5th paragraph of section 15-5.06C(1) with:

10-19-12

51-1.03F(5)

10-19-12

Delete the 9th paragraph of section 15-5.06C(1).

NOT FOR CONSTRUCTION

04-19-13

Delete the 15th paragraph of section 15-5.06C(1).

Add between the 18th and 19th paragraphs of section 15-5.06C(1):

07-19-13

Texture the polyester concrete surface before gelling occurs by longitudinal tining under 51-1.03F(5)(b)(iii), except do not perform initial texturing.

Replace section 15-5.06C(2) with:

04-19-13

15-5.06C(2) Reserved

04-19-13

Delete the 3rd paragraph of section 15-5.06D.

Replace the 1st paragraph in section 15-5.07B(4) with:

10-19-12

Payment for furnishing dowels is not included in the payment for core and pressure grout dowel.

Replace section 15-5.09 with:

04-19-13

15-5.09 POLYESTER CONCRETE EXPANSION DAMS

15-5.09A General

Section 15-5.09 includes specifications for constructing polyester concrete expansion dams.

Polyester concrete expansion dams must comply with the specifications for polyester concrete overlays in section 15-5.06, except a trial slab is not required.

Reinforcement must comply with section 52.

15-5.09B Materials

Not Used

15-5.09C Construction

For new asphalt concrete overlays, place the asphalt concrete overlay before starting polyester concrete activities. Saw cut and remove asphalt concrete at expansion dam locations.

For existing asphalt concrete overlays, remove expansion dams and asphalt concrete to the limits shown. Removing expansion dams must comply with section 15-4 except a bridge removal work plan is not required.

Where a portion of the asphalt concrete overlay is to remain, saw cut a 2-inch-deep neat line along the edge to remain in place before removing the asphalt concrete. Do not damage the existing surfacing to remain in place.

Prepare the deck surface under section 15-5.01C(2).

You may use a mechanical mixer to mix the polyester concrete for expansion dams. The mixer capacity must not exceed 9 cu ft unless authorized. Initiate the resin and thoroughly blend it immediately before mixing it with the aggregate. Mix the polyester concrete for at least 2 minutes before placing.

The application rate of methacrylate resin must be approximately 100 sq ft/gal.

You may place and finish expansion dams using hand methods.

NOT FOR CONSTRUCTION

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):

07-19-13

Within 5 days of completing annular space grouting at a culvert, submit the grouting records.

Replace "41-1.01" in item 10.3 in the list in the 2nd paragraph of section 15-6.01A(3)(d) with:

07-19-13

41-2

Replace "41-1.02" in 1st paragraph of section 15-6.01B(2) with:

07-19-13

41-2

Replace the heading of section 15-6.04 with:

01-18-13

INVERT PAVING

Replace the 1st paragraph of section 15-6.13A(1) with:

07-19-13

Section 15-6.13 includes specifications for installing machine spiral wound PVC pipeliners directly into the culvert.

Replace the heading of section 15-6.13B with:

07-19-13

Machine Spiral Wound PVC Pipeliners, Grouted

**^^^

Replace "20-1.03D" in the 2nd paragraph of section 16-1.03B with:

07-19-13

20-3.01C(3)

^^

19 EARTHWORK

07-19-13

Replace "20-3.03B(4)" in the 2nd paragraph of section 19-1.01A with:

07-19-13

20-2.02C(2)

Replace the 3rd paragraph in section 19-2.01A with:

07-19-13

Pavement removal within the limits of roadway excavation must comply with section 15-2.02B.

07-19-13

Delete the 2nd paragraph in section 19-2.03A.

Replace the 2nd paragraph of section 19-3.01A(2)(b) with:

07-01-11

For cofferdams on or affecting railroad property, allow 85 days for review.

Add to the list in the 1st paragraph of section 19-3.01A(2)(d):

01-20-12

9. Provisions for discontinuous rows of soil nails

Replace "sets" in the 3rd and 4th paragraphs of section 19-3.01A(2)(d) with:

04-19-13

copies

Add to section 19-3.01A(3)(b):

01-20-12

For soil nail walls, wall zones are specified in the special provisions.

For ground anchor walls, a wall zone is the entire wall unless otherwise specified in the special provisions.

01-20-12

Delete the 2nd sentence in the 4th paragraph of section 19-3.01A(3)(b).

NOT FOR CONSTRUCTION

Replace "90" in the paragraph of section 19-3.02G with:

01-18-13

90-1

Add to section 19-3.02:

07-19-13

19-3.02I Filter Fabric

Filter fabric must be Class A.

Replace the heading of section 19-3.03C with:

04-19-13

19-3.03B(4) Cofferdams

Replace the heading of section 19-3.03D with:

04-19-13

19-3.03B(5) Water Control and Foundation Treatment

Replace the 1st paragraph of section 19-3.03E(3) with:

01-20-12

Compact structure backfill behind lagging of soldier pile walls by hand tamping, mechanical compaction, or other authorized means.

Add to the end of section 19-3.03E(3):

07-19-13

If filter fabric is shown behind the lagging:

1. Immediately before placing the filter fabric, remove any loose or extraneous material and sharp objects from the surface to receive the filter fabric.
2. Handle and place the filter fabric under the manufacturer's instructions. Stretch, align, and place the fabric without wrinkling.
3. Stitch the adjacent borders of filter fabric or overlap the adjacent borders by 12 to 18 inches. If stitching the border, use yarn of a contrasting color. Yarn size and composition must be as recommended by the fabric manufacturer. Use 5 to 7 stitches per inch of seam.
4. Repair any damaged filter fabric by placing a piece of filter fabric large enough to cover the damaged area and comply with the overlapping or stitching requirements.

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

01-20-12

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

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

01-20-12

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

1. Complete stability testing

NOT FOR CONSTRUCTION

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.

01-18-13

3. Grout and shotcrete have cured for at least 72 hours.

01-20-12

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.

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

**^^^

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.

NOT FOR CONSTRUCTION

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

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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

NOT FOR CONSTRUCTION

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

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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.

11-15-13

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.

07-19-13

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.

11-15-13

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.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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

NOT FOR CONSTRUCTION

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

NOT FOR CONSTRUCTION

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

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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

NOT FOR CONSTRUCTION

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:

NOT FOR CONSTRUCTION

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

[a]Do not use containers made of biodegradable material.
[b]Grown in individual container cells.
[c]Bare root.

Trucks used for transporting plants must be equipped with covers to protect plants from windburn.

Handle and pack plants in an authorized way for the species or variety.

20-3.01B(2)(b) Cuttings

20-3.01B(2)(b)(i) General

Take cuttings at random from healthy, vigorous plants. Make cuts with sharp, clean tools. Do not take more than 25 percent of an individual plant and not more than 50 percent of the plants in an area.

Keep cuttings covered and wet until planted. Do not allow cuttings to dry or wither.

Plant cuttings no more than 2 days after being cut.

20-3.01B(2)(b)(ii) *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).

NOT FOR CONSTRUCTION

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 ± 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:

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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:

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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).

NOT FOR CONSTRUCTION

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

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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

NOT FOR CONSTRUCTION

20-5.03E(2)(d) Shredded Bark Mulch

Shredded bark mulch must:

1. Be derived from trees
2. Be a blend of loose, long, thin wood, or bark pieces
3. Contain at least 95 percent wood strands by volume with average thickness of 1/8 to 1-1/2 inches in any direction and 2 to 8 inches in length

20-5.03E(2)(e) Tree Trimming Mulch

Tree trimming mulch must:

1. Be derived from chipped trees and may contain leaves and small twigs.
2. Contain at least 95 percent material by volume less than 3 inches and no more than 30 percent by volume less than 1 inch

20-5.03E(2)(f)–20-5.03E(2)(j) Reserved

20-5.03E(3) Construction

Spread mulch placed in areas outside of plant basins to a uniform thickness as shown.

Mulch must be placed at the rate described and placed in the plant basins or spread in areas as shown after the plants have been planted. Mulch placed in plant basins must not come in contact with the plant crown and stem.

Spread mulch from the outside edge of the proposed plant basin or plant without basin to the adjacent edges of shoulders, paving, retaining walls, dikes, edging, curbs, sidewalks, walls, fences, and existing plantings. If the proposed plant or plant without basin is 12 feet or more from the adjacent edges of shoulders, paving, retaining walls, dikes, edging, curbs, sidewalks, walls, fences, and existing plantings, spread the mulch 6 feet beyond the outside edge of the proposed plant basin or plant without basin.

Do not place mulch within 4 feet of:

1. Flow line of earthen drainage ditches
2. Edge of paved ditches
3. Drainage flow lines

20-5.03E(4) Payment

Mulch is measured in the vehicle at the point of delivery.

20-5.03F–20-5.03J Reserved

20-5.04 RESERVED

Reserved

20-5.05 SITE FURNISHINGS

20-5.05A General

Section 20-5.05 includes specifications for installing site furnishings.

20-5.05B–20-5.05Z Reserved

20-5.06–20-5.10 RESERVED

^^

NOT FOR CONSTRUCTION

21 EROSION CONTROL

07-19-13

Replace ", bonded fiber matrix, and polymer-stabilized fiber matrix" in the 1st paragraph of section 21-1.01B with:

04-20-12

and bonded fiber matrix

04-20-12

Delete the last paragraph of section 21-1.02E.

Replace section 21-1.02F(2) with:

04-20-12

21-1.02F(2) Reserved

Replace "20-7.02D(1)" in the 1st paragraph of section 21-1.02H with:

07-19-13

20-3.01B(4)

Replace section 21-1.02J with:

04-20-12

21-1.02J Reserved

Replace the row for organic matter content in the table in the 4th paragraph of section 21-1.02M with:

01-18-13

Organic matter content	TMECC 05.07-A Loss-on-ignition organic matter method (LOI) % dry weight basis	30–100

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.

NOT FOR CONSTRUCTION

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.

01-18-13

Delete the 1st and 2nd sentences of the 3rd paragraph in section 21-1.04.

^^

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.

NOT FOR CONSTRUCTION

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

11-15-13

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.

07-19-13

Submit field qualification data and test reports including:

1. Mixing date
2. Mixing equipment and procedures used
3. Batch volume in cu yd, the minimum is 5 cu yd
4. Type and source of ingredients used
5. Age and strength from compression strength results

Field qualification test reports must be signed by the official in responsible charge of the laboratory performing the tests.

28-2.01D Quality Control and Assurance

28-2.01D(1) General

Stop LCB activities and immediately notify the Engineer whenever:

1. Any quality control or acceptance test result does not comply with the specifications
2. Visual inspection shows noncompliant LCB

If LCB activities are stopped, before resuming activities:

1. Inform the Engineer of the adjustments you will make
2. Remedy or replace the noncompliant LCB
3. Obtain authorization

Molds for compressive strength testing under ASTM C 31 or ASTM C 192 must be 6 by 12 inches.

Quality control and assurance for cementitious materials and admixtures must comply with section 90-1.01D(1).

28-2.01D(2) Aggregate Qualification Testing

Qualify the aggregate for each proposed aggregate source and gradation. Qualification tests include (1) sand equivalent and (2) average 7-day compressive strength under ASTM C 39 on 3 specimens manufactured under ASTM C 192. The cement content for this test must be 300 lb/cu yd, and the 7-day average compressive strength must be at least 610 psi. Cement must be Type II portland cement under section 90-1.02B(2).

LCB must have from 3 to 4 percent air content during aggregate qualification testing.

NOT FOR CONSTRUCTION

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:

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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:

Aggregate Grading

Sieve sizes	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.

NOT FOR CONSTRUCTION

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

NOT FOR CONSTRUCTION

2. Before the atmospheric temperature falls below 40 degrees F
3. At a rate of 1 gal/150 sq ft for the first application
4. At a rate of 1 gal/200 sq ft for the second application. Within 4 days after the first application, clean the surface and apply the second application.

Immediately repair damage to the curing compound or LCB.

28-2.03G Surfaces Not Within Tolerance

Where LCB will be paved with concrete pavement, remove the base wherever the surface is higher than the grade established by the Engineer and replace it with LCB. Where LCB will not be paved with concrete pavement, remove the base wherever the surface is higher than 0.05 foot above the grade established by the Engineer and replace it with LCB. If authorized, grind the surface with either a diamond or carborundum blade to within tolerance. After grinding LCB to be paved with concrete pavement and after all free water has left the surface, clean foreign material and grinding residue from the surface. Apply curing compound to the ground area at a rate of approximately 1 gal/150 sq ft.

Where the surface of LCB is lower than 0.05 foot from the grade established by the Engineer, remove the base and replace it with LCB or, if authorized, fill low areas according to the pavement material as follows:

1. For HMA pavement, fill low areas with HMA that complies with the specifications for the lowest layer of pavement. Do not fill low areas concurrently with the paving operation.
2. For concrete pavement, fill low areas with pavement concrete concurrent with the paving operation.

28-2.04 PAYMENT

LCB is measured from the dimensions shown.

Replace section 28-3 with:

07-19-13

28-3 RAPID STRENGTH CONCRETE BASE

Reserved

Replace section 28-4 with:

07-19-13

28-4 LEAN CONCRETE BASE RAPID SETTING

Reserved

Replace section 28-5 with:

07-19-13

28-5 CONCRETE BASE

Reserved

Add to section 28:

07-19-13

28-6–28-14 RESERVED

28-15 REPLACE BASE

Reserved

NOT FOR CONSTRUCTION

^^

DIVISION IV SUBBASES AND BASES

29 TREATED PERMEABLE BASES

07-19-13

Replace "section 68-4.02C" in the 6th paragraph of section 29-1.03A with:

04-20-12

section 64-4.03

Replace "3rd" in the 4th paragraph of section 29-1.03C with:

07-19-13

4th

^^

Replace section 30 with:

04-20-12

30 RECLAIMED PAVEMENTS

04-20-12

30-1 GENERAL

30-1.01 GENERAL

Section 30 includes specifications for reclaiming the pavement section and constructing a base.

30-2 FULL DEPTH RECLAIMED—FOAMED ASPHALT

Reserved

30-3–30-6 RESERVED

^^

DIVISION V SURFACINGS AND PAVEMENTS

Replace section 36 with:

07-19-13

36 GENERAL

07-19-13

36-1 GENERAL

Section 36 includes general specifications for constructing surfacings and pavements.

36-2 BASE BOND BREAKER

Reserved

36-3–36-15 RESERVED

^^

NOT FOR CONSTRUCTION

37 BITUMINOUS SEALS

07-19-13

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

NOT FOR CONSTRUCTION

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 Loss at 100 revolutions. Loss at 500 revolutions.	California Test 211	 10 40
Film stripping, %, max	California Test 302	25

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:

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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

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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 of a seal coat, followed by sand.

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

Submit a 1/2-gallon sample of asphaltic emulsion in a plastic container. Take the sample from the distributor truck spray bar at mid load.

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.

Submit a sample of asphaltic emulsion to the authorized laboratory and the Engineer. Each sample must be submitted in an insulated shipping container within 24 hours of sampling.

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.

Within 3 business days of sampling, the authorized laboratory must test 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

Circulate polymer 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. Take two 1/2-gallon samples in the presence of the Engineer.

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If test results for asphaltic emulsion are not in compliance with the specifications, you may request that the asphaltic emulsion seal coat represented by the tests remain in place with a payment deduction based on the pay factors.

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

	Percentage passing			
Sieve sizes	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.

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37-2.04B(3) Construction

Asphaltic emulsion must be applied within the application rate ranges shown in the following table:

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.

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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:

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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

[a] The highest pay factor applies

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.

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. Test elastic recovery under AASHTO T 301.
3. Polymer content in percent by weight does not apply.
4. The minimum ring and ball softening point temperature determined under AASHTO T 53 for Test on Residue from Evaporation Test must comply with the following:
   - 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:

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Polymer Asphaltic Emulsion Seal Coat Screenings Gradation

	Percentage passing			
Sieve sizes	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.

37-2.04C(3) Construction

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

The Engineer determines the exact application rate.

At the time of application, the temperature of polymer asphaltic emulsion must be from 130 to 180 degrees F.

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.

When tested under California Test 339, the application rate for polymer 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

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.

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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:

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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

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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.

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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:

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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-milimeter 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

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material retained on the 2.00-milimeter sieve must be added to the scale or balance. Weigh and record that mass as the accumulative mass retained on the 2.00-milimeter 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:

NOT FOR CONSTRUCTION

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 ($x10^{-3}$)	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

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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

37-2.06–37-2.10 RESERVED

Add to section 37-3.01D(1):

01-18-13

Micro-surfacing spreader operators must attend the prepaving conference.

^^

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.

NOT FOR CONSTRUCTION

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:

10-19-12

as shown

Replace "less than 10 percent" in note "b" in the table in the 5th paragraph of section 39-1.02E with:

01-20-12

10 percent or less

Replace the paragraphs in section 39-1.02F with:

02-22-13

39-1.02F(1) General

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 mm ± 1mm
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.

NOT FOR CONSTRUCTION

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 ±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 ± 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 ± 2.0 percent of the average binder content of the original processed RAP stockpile.

The maximum specific gravity for processed RAP must be within ± 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 ±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:

NOT FOR CONSTRUCTION

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	--

[a]Test 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.

NOT FOR CONSTRUCTION

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:

01-20-12

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

Add to the end of section 39-1.03C:

02-22-13

For RAP substitution rate greater than 15 percent, submit with the JMF submittal:

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:

04-20-12

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.

Add between the 3rd and 4th paragraphs of section 39-1.03E:

04-20-12

Asphalt binder set point for HMA must be the OBC specified on your *Contractor Hot Mix Asphalt Design Data* form. When RAP is used, asphalt binder set point for HMA must be:

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

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:

04-20-12

4. HMA quality specified in the table titled "HMA Mix Design Requirements" except:

NOT FOR CONSTRUCTION

4.1. Air void content, design value ±2.0 percent
4.2. Voids filled with asphalt, report only
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.

01-20-12

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

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.

NOT FOR CONSTRUCTION

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:

01-20-12

3 business days

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

01-20-12

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

NOT FOR CONSTRUCTION

Replace "batch" in the 2nd sentence in the 2nd paragraph of section 39-1.04C with:

07-19-13

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.

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.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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_{QC5} 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

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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:

04-20-12

6.4

Replace "6.0" in item 3 in the list in the 4th paragraph of section 39-1.14 with:

04-20-12

5.7

Replace "6.8" in the 1st paragraph of section 39-1.15B with:

04-20-12

6.4

Replace "6.0" in the 1st paragraph of section 39-1.15B with:

04-20-12

5.7

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:

NOT FOR CONSTRUCTION

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]	California Test 366	1 per 4,000 tons or 2 per 5 business days, whichever is greater				
No. 4 and 3/8" gradings			30	30	--	--
1/2" and 3/4" gradings			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)	California Test 205	As designated in the QC plan. At least once per project				
One fractured face			90	25	--	90
Two fractured faces			75	--	90	75
Fine aggregate (%, min) (Passing no. 4 sieve and retained on no. 8 sieve.)						
One fractured face			70	20	70	90
Los Angeles Rattler (%, max)	California Test 211					
Loss at 100			12	--	12	12

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rev. 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[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 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	California Test 371	For RAP ≥15%	70	70	--	--

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(tensile strength ration, %)[j]		1 per 10,000 tons or 1 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.

NOT FOR CONSTRUCTION

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				
No. 4 and 3/8" gradings					30	30	--	--
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 Coarse aggregate (%, min)				California Test 205				
One fractured face					90	25	--	90
Two fractured faces					75	--	90	75
Fine aggregate (%, min) (Passing no. 4 sieve and retained on no. 8 sieve.) One fractured face					70	20	70	90
Los Angeles Rattler (%, max)				California Test 211				
Loss at 100 rev.					12	--	12	12
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				
No. 4 grading					65.0–75.0	65.0–75.0		
3/8" grading					65.0–75.0	65.0–75.0	Report only	--
1/2" grading					65.0–75.0	65.0–75.0		
3/4" grading					65.0–75.0	65.0–75.0		
Voids in mineral aggregate (% min) [i]				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	

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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 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 PI_0	12-foot straight-edge, must grind, and PI_0	12-foot straight-edge, must grind, and PI_0	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.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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]	California Test 366				
No. 4 and 3/8" gradings		30	30	--	--
1/2" and 3/4" gradings		37	35	23	--
Percent of crushed particles	California Test 205				
Coarse aggregate (% min)					
One fractured face		90	25	--	90
Two fractured faces		75	--	90	75
Fine aggregate (% min) (Passing no. 4 sieve and retained on no. 8 sieve.)					
One fractured face		70	20	70	90
Los Angeles Rattler (% max)	California Test 211				
Loss at 100 rev.		12	--	12	12
Loss at 500 rev.		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]	California Test 367				
No. 4 grading		65.0–75.0	65.0–75.0	Report only	--
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		
Voids in mineral aggregate (% min) [f]	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	
Dust proportion [f]	California Test 367				
No. 4 and 3/8" gradings		0.6–1.2	0.6–1.2	Report only	--
1/2" and 3/4" gradings		0.6–1.2	0.6–1.2		
Hamburg wheel track (minimum number of passes at 0.5 inch average rut depth)[g]	AASHTO T 324 (Modified)			--	--
PG-58		10,000	10,000		

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PG-64 PG-70 PG-76 or higher		15,000 20,000 25,000	15,000 20,000 25,000		
Hamburg wheel track (inflection point minimum number of passes)[g] 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)[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:

01-20-12

285 degrees F

Replace "5,000" in the 5th paragraph of section 39-4.02C with:

02-22-13

10,000

Replace the 7th paragraph of section 39-4.02C with:

02-22-13

Except for RAP substitution rate of greater than 15 percent, the Department does not use results from California Test 371 to determine specification compliance.

NOT FOR CONSTRUCTION

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:

NOT FOR CONSTRUCTION

Minimum Quality Control—QC/QA Construction Process

Quality characteristic	Test method	Minimum sampling and testing frequency	HMA Type			Location of sampling	Maximum reporting 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	--	--	--	Stockpiles 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] 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 37	 30 35	 -- 23		48 hours
Air void content (%)[f,g]	California Test 367		4 ± 2	4 ± 2	TV ± 2		

NOT FOR CONSTRUCTION

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 QC plan. At least once per project.	90 75 70	25 -- 20	-- 90 70	California Test 125	48 hours
Los Angeles Rattler (% max): Loss at 100 rev. Loss at 500 rev.	California Test 211		12 45	-- 50	12 40	California Test 125	
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		 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		

NOT FOR CONSTRUCTION

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[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 track (minimum number of passes at 0.5 inch average rut depth)[i] 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	--	

NOT FOR CONSTRUCTION

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

NOT FOR CONSTRUCTION

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]							
	Sieve	3/4"	1/2"	3/8"					
1	1/2"	X [b]	--	--	0.05	California Test 202	JMF ± Tolerance [c]		
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 70	 25 -- 20	 -- 90 70
	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

NOT FOR CONSTRUCTION

	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
	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

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[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:

07-19-13

40-1 GENERAL

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.

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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:

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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.

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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.

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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

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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.

NOT FOR CONSTRUCTION

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_TTCCCRRR_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.

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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:

Acceptance Testing

Property	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

[a]A single test represents no more than the frequency specified.
[b]Tested 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:

$$t = \frac{|\overline{X}_c - \overline{X}_v|}{S_p\sqrt{\frac{1}{n_c} + \frac{1}{n_v}}} \quad \text{and} \quad S_p^2 = \frac{S_c^2(n_c - 1) + S_v^2(n_v - 1)}{n_c + n_v - 2}$$

where:

n_c = Number of your quality control tests (minimum of 6 required)
n_v = Number of Department's tests (minimum of 2 required)
$\overline{X}_c$ = Mean of your quality control tests
$\overline{X}_v$ = 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 tcrit, using degrees of freedom showing in the following table:

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degrees of freedom (nc+nv-2)	tcrit (for α = 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

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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	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:

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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	The minimum distance measured from concrete pavement surface to any point along the top of dowel bar must be: DB + 1/2 inch where: DB = one third of pavement thickness in inches, or the saw cut depth, whichever is greater The maximum distance below the depth shown must be 5/8 inch.

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.

NOT FOR CONSTRUCTION

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:

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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:

Aggregate Filler Grading

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

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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

NOT FOR CONSTRUCTION

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

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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:

NOT FOR CONSTRUCTION

Deduction for Thickness Deficiency

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

[a]Values 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.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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

NOT FOR CONSTRUCTION

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

^^

NOT FOR CONSTRUCTION

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:

NOT FOR CONSTRUCTION

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

[a]Perform test with aggregate filler if used.
[b]Test 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:

NOT FOR CONSTRUCTION

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 ASTM D618	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 ASTM D618	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

[a]Perform the test before adding initiator.
[b]For 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:

Combined Aggregate Grading

Sieve size	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.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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

NOT FOR CONSTRUCTION

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

[a]Perform 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.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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)

[a]Test at the most frequent interval.
[b]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 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

NOT FOR CONSTRUCTION

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

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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

NOT FOR CONSTRUCTION

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

^^

42 GROOVE AND GRIND CONCRETE

07-19-13

Replace the paragraph of section 42-1.01A with:

07-19-13

Section 42-1 includes general specifications for grooving and grinding concrete.

NOT FOR CONSTRUCTION

Replace the headings and paragraphs in section 42-3 with:

07-19-13

42-3.01 GENERAL

42-3.01A Summary

Section 42-3 includes specifications for grinding the surfaces of pavement, bridge decks, and approach slabs.

42-3.01B Definitions

Reserved

42-3.01C Submittals

Reserved

42-3.01D Quality Control and Assurance

Reserved

42-3.02 MATERIALS

Not Used

42-3.03 CONSTRUCTION

42-3.03A General

Grind surfaces in the longitudinal direction of the traveled way and grind the full lane width. Begin and end grinding at lines perpendicular to the roadway centerline.

Grinding must result in a parallel corduroy texture with grooves from 0.08 to 0.12 inch wide and from 55 to 60 grooves per foot of width. Grooves must be from 0.06 to 0.08 inch from the top of the ridge to the bottom of the groove.

Grind with abrasive grinding equipment using diamond cutting blades mounted on a self-propelled machine designed for grinding and texturing concrete pavements.

42-3.03B Pavement

Grind existing concrete pavement that is adjacent to an individual slab replacement. Grind the replaced individual slab and all the existing slabs immediately surrounding it. Grind after the individual slab is replaced.

Grind existing concrete pavement that is adjacent to new lanes of concrete pavement. Grind before paving.

After grinding, the existing pavement must comply with requirements for smoothness and coefficient of friction in section 40 except:

1. At the midpoint of a joint or crack, test smoothness with a straightedge. Both sides must have uniform texture.
2. Straightedge and inertial profiler requirements do not apply to areas abnormally depressed from subsidence or other localized causes. End smoothness testing 15 feet before and resume 15 feet after these areas.
3. Cross-slope must be uniform and have positive drainage across the traveled way and shoulder.

As an alternative to grinding existing concrete pavement, you may replace the existing pavement. The new concrete pavement must be the same thickness as the removed pavement. Replace existing pavement between longitudinal joints or pavement edges and transverse joints. Do not remove portions of slabs.

Replacement of existing concrete pavement must comply with requirements for individual slab replacement in section 41-9.

42-3.03C Bridge Decks, Approach Slabs, and Approach Pavement

Grind bridge decks, approach slabs, and approach pavement only if described.

NOT FOR CONSTRUCTION

The following ground areas must comply with the specifications for smoothness and concrete cover over reinforcing steel in section 51-1.01D(4):

1. Bridge decks
2. Approach slabs
3. Adjacent 50 feet of approach pavement

After grinding, the coefficient of friction must comply with section 51-1.01D(4).

42-3.04 PAYMENT

Grinding existing approach slabs and adjacent 50 feet of approach pavement is paid for as grind existing bridge deck.

The Department does not pay for grinding replacement concrete pavement or for additional grinding to comply with smoothness requirements.

Add to section 42:

07-19-13

42-4–42-9 RESERVED

^^

DIVISION VI STRUCTURES

46 GROUND ANCHORS AND SOIL NAILS

07-19-13

Replace the 1st paragraph of section 46-1.01C(2) with:

04-19-13

Submit 5 copies of shop drawings to OSD, Documents Unit. Notify the Engineer of the submittal. Include in the notification the date and contents of the submittal. Allow 30 days for the Department's review. After review, submit from 6 to 12 copies, as requested, for authorization and use during construction.

Shop drawings and calculations must be sealed and signed by an engineer who is registered as a civil engineer in the State.

Replace the 3rd paragraph of section 46-1.01C(2) with:

01-18-13

Ground anchor shop drawings must include:

1. Details and specifications for the anchorage system and ground anchors.
2. Details for the transition between the corrugated plastic sheathing and the anchorage assembly.
3. If shims are used during lock-off, shim thickness and supporting calculations.
4. Calculations for determining the bonded length. Do not rely on any capacity from the grout-to-ground bond within the unbonded length.

01-18-13

Delete the 5th and 6th paragraphs of section 46-1.01C(2).

NOT FOR CONSTRUCTION

Replace the 4th paragraph of section 46-1.01D(2)(b) with:

01-18-13

Each jack and its gage must be calibrated as a unit under the specifications for jacks used to tension prestressing steel permanently anchored at 25 percent or more of its specified minimum ultimate tensile strength in section 50-1.01D(3).

Replace the 3rd paragraph of section 46-1.01D(2)(d) with:

07-19-13

The Department may verify the test loads using the Department's load cells. If requested, install and support the Department's testing equipment during testing and remove the equipment after testing is complete.

Add to section 46-1.02:

07-19-13

46-1.02C Grout

Grout must consist of cement and water and may contain an admixture if authorized. Cement must comply with section 90-1.02B(2). Water must comply with section 90-1.02D. Admixtures must comply with 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:

04-20-12

Dispose of drill cuttings under section 19-2.03B.

Add to the end of section 46-1.03C:

07-19-13

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

07-19-13

Delete the 3rd paragraph of section 46-2.01A.

Add to the beginning of section 46-2.01C:

07-19-13

Submittals for strand tendons, bar tendons, bar couplers, and anchorage assemblies must comply with section 50-1.01C.

NOT FOR CONSTRUCTION

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.

Add between the 13th and 14th paragraphs of section 46-2.03A:

07-19-13

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.

Add between the 1st and 2nd paragraphs of section 46-2.03D:

07-19-13

Secure the ends of strand tendons with a permanent type anchorage system that:

1. Holds the prestressing steel at a force producing a stress of at least 95 percent of the specified ultimate tensile strength of the steel
2. Permanently secures the ends of the prestressing steel

Replace the 2nd sentence of the 1st paragraph of section 46-3.02A with:

07-19-13

The epoxy-coated prefabricated reinforcing bar must comply with section 52-2.03, except the epoxy thickness must be from 10 to 12 mils.

Replace the 2nd paragraph of section 46-3.02B with:

07-19-13

Concrete anchors on bearing plates must comply with the specifications for studs in clause 7 of AWS D1.1.

07-19-13

Delete the 1st paragraph of section 46-3.02E.

^^

NOT FOR CONSTRUCTION

47 EARTH RETAINING SYSTEMS

07-19-13

Replace the 2nd paragraph of section 47-2.01D with:

02-17-12

Coupler test samples must comply with minimum tensile specifications for steel wire in ASTM A 82/A 82M. Total wire slip must be at most 3/16 inch when tested under the specifications for tension testing of round wire test samples in ASTM A 370.

Replace "78-80" in the 1st table in the 2nd paragraph of section 47-2.02C with:

10-19-12

78-100

Replace the value for the sand equivalent requirement in the 2nd table in the 3rd paragraph of section 47-2.02C with:

01-20-12

12 minimum

Replace the 1st paragraph of section 47-2.02E with:

02-17-12

Steel wire must comply with ASTM A 82/A 82M. Welded wire reinforcement must comply with ASTM A 185/A 185M.

Replace section 47-3 with:

07-19-13

47-3 REINFORCED CONCRETE CRIB WALLS

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.

NOT FOR CONSTRUCTION

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.

If the Engineer determines that rock pockets are of the extent or character as to affect the strength of the member or to endanger the life of the steel reinforcement, replace the member.

Finish concrete-to-concrete bearing surfaces to a smooth plane. Section 51-1.03F does not apply to concrete crib members.

47-3.03 Construction

Place reinforced concrete crib walls to the lines and grades established by the Engineer. The foundation must be accepted by the Engineer before any crib members are placed.

The gap between bearing surfaces must not exceed 1/8 inch.

Where a gap of 1/16 inch to 1/8 inch exists or where shown, place a 1/16-inch pad of asphalt felt or sheet neoprene between the bearing surfaces.

47-3.04 Payment

The area of reinforced concrete crib wall is measured on the batter at the outer face for the height from the bottom of the bottom stretcher to the top of the top stretcher and for a length measured from end to end of each section of wall.

Add between the 3rd and 4th paragraphs of section 47-5.01:

10-19-12

Reinforcement must comply with section 52.

Add to section 47-6.01A:

10-19-12

The alternative earth retaining system must comply with the specifications for the type of wall being constructed.

Replace "sets" at each occurrence in the 1st paragraph of section 47-6.01C with:

04-19-13

copies

NOT FOR CONSTRUCTION

^^

48 TEMPORARY STRUCTURES

07-19-13

Replace "previously welded splice" and its definition in section 48-2.01B with:

04-19-13

previously welded splice: Splice made in a falsework member in compliance with AWS D1.1 or other recognized welding standard before contract award.

Add to section 48-2.01B:

07-19-13

independent support system: Support system that is in addition to the falsework removal system employing methods of holding falsework from above by winches, hydraulic jacks with prestressing steel, HS rods, or cranes.

04-19-13

Delete "field" in the 1st sentence of the 5th paragraph of section 48-2.01C(1).

Replace item 1 in the list in the 6th paragraph of section 48-2.01C(1) with:

04-19-13

1. Itemize the testing, inspection methods, and acceptance criteria used

Replace "sets" at each occurrence in the 4th paragraph of section 48-2.01C(2) with:

07-19-13

copies

Replace the 7th paragraph of section 48-2.01C(2) with:

09-16-11

If you submit multiple submittals at the same time or additional submittals before review of a previous submittal is complete:

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

Add to section 48-2.01C(2):

07-19-13

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:

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

NOT FOR CONSTRUCTION

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:

04-19-13

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.

Replace the 1st through 3rd sentences in the 2nd paragraph of section 48-2.01D(2) with:

04-19-13

Perform NDT on welded splices using UT or RT. Each weld and any repair made to a previously welded splice must be tested.

Replace the 3rd paragraph of section 48-2.01D(2) with:

04-19-13

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.

Add to section 48-2.01D(3)(a):

07-19-13

Falsework removal system employing methods of holding falsework from above and members of the independent support system must support the sum of the actual vertical and horizontal loads due to falsework materials, equipment, construction sequence or other causes, and wind loading. Identifiable mechanical devices used in the falsework removal plan must meet applicable industry standards and manufacturer instructions for safe load carrying capacity. Unidentifiable winches must be capable of carrying twice the design load.

The load used for the analysis of overturning moment and sliding of the winch system must be 150 percent of the design load.

Add to section 48-2.03D:

07-19-13

Falsework removal employing methods of holding falsework by winches, hydraulic jacks with prestressing steel, HS rods, or cranes must also be supported by an independent support system when the system is not actively lowering the falsework at vehicular, pedestrian, or railroad traffic openings.

Bridge deck openings used to facilitate falsework removal activities must be formed and located away from the wheel path. The formed openings must be wedge shaped with a 5-inch maximum diameter at the top and a 3-inch maximum diameter at the bottom.

Anchor 10-inch-square aluminum or galvanized steel wire, 1/4-inch-mesh hardware cloth with a 0.025-inch minimum wire diameter firmly to the inside of the soffit openings. Construct a 1/2-inch drip groove to the outside of soffit openings.

Clean and roughen openings made in the bridge deck. Fill the deck openings with rapid setting concrete complying with section 15-5.02.

^^

NOT FOR CONSTRUCTION

49 PILING

07-19-13

Replace "sets" in the 1st paragraph of section 49-1.01C(2) with:

04-19-13

copies

Replace "set" in the 2nd paragraph of section 49-1.01C(2) with:

04-19-13

copy

Replace "Load Applied to Pile by Hydraulic Jack(s) Acting at One End of Test Beam(s) Anchored to the Pile" in the 5th paragraph of section 49-1.01D(2) with:

07-20-12

"Tensile Load Applied by Hydraulic Jack(s) Acting Upward at One End of Test Beam(s)"

Add to section 49-1.03:

04-20-12

Dispose of drill cuttings under section 19-2.03B.

Replace the paragraph of section 49-2.01A(1) with:

07-19-13

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.

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

01-20-12

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

Replace the paragraph of section 49-2.02A(1) with:

07-19-13

Section 49-2.02 includes specifications for fabricating and installing steel pipe piles.

Replace the definitions in section 49-2.02A(2) with:

07-19-13

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.

Replace item 2 in the list in the paragraph of section 49-2.02A(3)(b) with:

07-19-13

2. Certified mill test reports for each heat number of steel used in pipe piles being furnished.

NOT FOR CONSTRUCTION

Replace the paragraph of section 49-2.02A(4)(a) with:

07-19-13

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.

Replace "0.45" in the 2nd paragraph of section 49-2.02B(1)(a) with:

07-19-13

0.47

Replace the 1st paragraph of section 49-2.02B(1)(b) with:

07-19-13

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).

Add to section 49-2.02B(1):

07-19-13

49-2.02B(1)(d) Reserved

Replace "4.8.4" in item 2.3 in the list in the 2nd paragraph of section 49-2.02B(2) with:

07-19-13

4.9.4

07-19-13

Delete the 3rd paragraph of section 49-2.02C(2).

Replace the paragraph of section 49-2.03A(1) with:

07-19-13

Section 49-2.03 includes specifications for fabricating and installing structural shape steel piles.

Replace the paragraph of section 49-2.03A(3) with:

07-19-13

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.

Replace the 1st paragraph of section 49-2.03B with:

07-19-13

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.

NOT FOR CONSTRUCTION

Replace "sets" in the 1st paragraph of section 49-2.04A(3) with:

04-19-13

copies

07-19-13

Delete the 1st paragraph of section 49-2.04A(4).

Replace the 3rd and 4th paragraphs of section 49-2.04B(2) with:

10-19-12

Piles in a corrosive environment must be steam or water cured under section 90-4.03.

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:

07-19-13

Section 49-3.01 includes general specifications for constructing CIP concrete piles.

Add to section 49-3.01A:

01-20-12

Concrete must comply with section 51.

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

01-20-12

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.

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

01-20-12

dry hole:

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

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

01-20-12

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

NOT FOR CONSTRUCTION

Replace item 5 in the list in the 1st paragraph of section 49-3.02A(3)(b) with:

10-19-12

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

Add to the list in the 1st paragraph of section 49-3.02A(3)(b):

01-18-13

8. Drilling sequence and concrete placement plan.

Replace item 2 in the list in the 1st paragraph of section 49-3.02A(3)(g) with:

01-20-12

2. Be sealed and signed by an engineer who is registered as a civil engineer in the State. This requirement is waived for either of the following conditions:
   2.1. The proposed mitigation will be performed under the current Department-published version of *ADSC Standard Mitigation Plan 'A' - Basic Repair* without exception or modification.
   2.2. The Engineer determines that the rejected pile does not require mitigation due to structural, geotechnical, or corrosion concerns, and you elect to repair the pile using the current Department-published version of *ADSC Standard Mitigation Plan 'B' - Grouting Repair* without exception or modification.

Replace "49-2.03A(4)(d)" in the 1st paragraph of section 49-3.02A(4)(d)(i) with:

07-19-13

49-3.02A(4)(d)

Add to the beginning of section 49-3.02A(4)(d)(ii):

07-19-13

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.

Replace item 1 in the list in the 1st paragraph of section 49-3.02A(4)(d)(ii) with:

01-20-12

1. Inspection pipes must be schedule 40 PVC pipe complying with ASTM D 1785 with a nominal pipe size of 2 inches. Watertight PVC couplers complying with ASTM D 2466 are allowed to facilitate pipe lengths in excess of those commercially available. Log the location of the inspection pipe couplers with respect to the plane of pile cutoff.

Add to section 49-3.02A(4)(d)(iv):

01-20-12

If the Engineer determines it is not feasible to use one of ADSC's standard mitigation plans to mitigate the pile, schedule a meeting and meet with the Engineer before submitting a nonstandard mitigation plan.

NOT FOR CONSTRUCTION

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:

07-19-13

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.

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.

NOT FOR CONSTRUCTION

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:

07-19-13

Steel soldier piles must comply with section 49-2.03.

Replace the headings and paragraphs in section 49-4.02 with:

07-19-13

Concrete anchors must comply with the specifications for studs in clause 7 of AWS D1.1.

^^

NOT FOR CONSTRUCTION

50 PRESTRESSING CONCRETE

07-19-13

Replace "sets" at each occurrence in the 2nd and 3rd paragraphs of section 50-1.01C(3) with:

04-19-13

copies

Add to section 50-1.01C(3):

07-19-13

Include a grouting plan with your shop drawing submittal. The grouting plan must include:

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

NOT FOR CONSTRUCTION

Replace the introductory clause in the 1st paragraph of section 50-1.01C(4) with:

07-19-13

Submit test samples for the materials shown in the following table to be used in the work:

Add between "the" and "test samples" in the 1st paragraph of section 50-1.01D(2):

07-19-13

prestressing steel

Replace the 3rd paragraph of section 50-1.01D(2) with:

10-19-12

The Department may verify the prestressing force using the Department's load cells.

Replace the 3rd paragraph in section 50-1.01D(3) with:

07-19-13

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.

Add between the 5th and 6th paragraphs of section 50-1.01D(3):

07-19-13

Each jack and its gages must be calibrated as a unit.

Replace the 6th paragraph in section 50-1.01D(3) with:

07-19-13

Each jack used to tension prestressing steel permanently anchored at 25 percent or more of its specified minimum ultimate tensile strength must be calibrated by METS within 1 year of use and after each repair. You must:

1. Schedule the calibration of the jacking equipment with METS
2. 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.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

07-19-13

Delete the 5th paragraphs of section 50-1.02C.

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

07-19-13

Delete the 2nd sentences in the 1st paragraph of section 50-1.02E.

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.

NOT FOR CONSTRUCTION

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.

07-19-13

Delete "at least" in the 1st paragraph of section 50-1.03B(1).

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.

07-19-13

Delete the 1st through 4th paragraphs of section 50-1.03B(2)(a).

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.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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.

Vacuum grouting equipment must consist of:

1. Volumeter for the measurement of void volume
2. Vacuum pump with capacity of at least 10 cfm and equipped with a flow meter capable of measuring the amount of grout being injected

50-1.03B(2)(d)(x) Vertical Tendon Grouting

Provide a standpipe at the upper end of the tendon to collect bleed water and allow it to be removed from the grout. The standpipe must be large enough to prevent the grout elevation from dropping below the highest point of the upper anchorage device. If the grout level drops to the highest point of the upper anchorage device, immediately add grout to the standpipe.

Remove the standpipe after the grout has hardened.

For vertical tendons in excess of 100 feet high or if grouting pressure exceeds 145 psi, inject grout at a higher vent from which grout has already flowed to maintain one-way flow.

50-1.03B(2)(d)(xi) Vents

Place vents at the following locations:

1. Anchorage areas at both ends of the tendon
2. Each high point
3. 4 feet upstream and downstream of each crest of a high point

NOT FOR CONSTRUCTION

4. Each change in the cross section of duct

Add to section 50-1.03B(2):

09-16-11

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

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

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

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

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

^^

51 CONCRETE STRUCTURES

07-19-13

Replace the paragraphs of section 51-1.01A with:

10-19-12

Section 51-1 includes general specifications for constructing concrete structures.

Earthwork for the following concrete structures must comply with section 19-3:

1. Sound wall footings
2. Sound wall pile caps
3. Culverts
4. Barrier slabs
5. Junction structures
6. Minor structures
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.

NOT FOR CONSTRUCTION

Replace "sets" in the 1st paragraph of section 51-1.01C(2) with:

07-19-13

copies

Replace the heading of section 51-1.01D(4) with:

04-19-13

Testing Concrete Surfaces

Add to section 51-1.01D(4)(a):

04-19-13

The Engineer tests POC deck surfaces for smoothness and crack intensity.

Add to the list in the 1st paragraph of section 51-1.01D(4)(b):

04-19-13

3. Completed deck surfaces, including ramps and landings of POCs

Replace the 4th paragraph in section 51-1.01D(4)(b) with:

04-19-13

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.

Add between the 5th and 6th paragraphs of section 51-1.01D(4)(b):

04-19-13

POC deck surfaces must comply with the following smoothness requirements:

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.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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:

04-19-13

copies

Replace "set" in the 7th paragraph of section 51-2.02D(1)(c)(ii) with:

04-19-13

copy

Add to the 1st paragraph of section 51-2.02D(3):

04-19-13

POC deck surfaces must comply with section 51-1.03F(6) before placing and anchoring joint seal assemblies.

NOT FOR CONSTRUCTION

Replace "sets" in the 2nd paragraph of section 51-2.02E(1)(c) with:

04-19-13

copies

Replace "set" in the 6th paragraph of section 51-2.02E(1)(c) with:

04-19-13

copy

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

08-05-11

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.

Replace "sets" in the 1st and 2nd paragraphs of section 51-2.02F(1)(c) with:

04-19-13

copies

Add between the 1st and 2nd paragraphs of section 51-4.01A:

10-19-12

Prestressing concrete members must comply with section 50.

04-20-12

Delete the 2nd paragraph of section 51-4.01A.

Replace the 3rd paragraph of section 51-4.01C(2) with:

04-20-12

For segmental or spliced-girder construction, shop drawings must include the following additional information:

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:

04-19-13

copies

NOT FOR CONSTRUCTION

10-19-12

Delete the 1st and 2nd paragraphs of section 51-4.02A.

Replace the 3rd paragraph of section 51-4.02B(2) with:

04-20-12

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.

Add to section 51-4.02B(2):

04-20-12

At spliced-girder closure joints:

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:

04-20-12

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.

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:

07-19-13

Structure excavation and backfill must comply with section 19-3.

Treated permeable base must comply with section 29.

07-19-13

Delete the 1st paragraph of section 51-5.03B(3).

07-19-13

Delete the 2nd paragraph of section 51-5.03D(1).

Add between the 1st and 2nd paragraphs of section 51-7.01A:

10-19-12

Minor structures include:

1. Pipe culvert headwalls and endwalls for a pipe with a diameter less than 5 feet

NOT FOR CONSTRUCTION

2. Drainage inlets
3. Other structures described as minor structures

10-19-12

Delete the 4th paragraph of section 51-7.01A.

Replace the 1st and 2nd paragraphs of section 51-7.01B with:

10-19-12

Concrete must comply with the specifications for minor concrete.

Add to section 51:

10-19-12

51-8–51-15 RESERVED

**^^^

Replace section 52-6.02D with:

10-21-11

52-6.02D Ultimate Butt Splice Requirements

When tested under California Test 670, ultimate butt splice test samples must demonstrate necking as either of the following:

1. For "Necking (Option I)," the test sample must rupture in the reinforcing bar outside of the affected zone and show visible necking.
2. For "Necking (Option II)," the largest measured strain must be at least:
   2.1. Six percent for no. 11 and larger bars
   2.2. Nine percent for no. 10 and smaller bars

Replace the 2nd and 3rd paragraphs of section 52-6.03B with:

01-18-13

Do not splice the following by lapping:

1. No. 14 bars
2. No. 18 bars
3. Hoops
4. Reinforcing bars where you cannot provide a minimum clear distance of 2 inches between the splice and the nearest adjacent bar

^^

53 SHOTCRETE

07-19-13

Replace the 2nd and 3rd paragraphs of section 53-2.01D(1) with:

07-19-13

Obtain and test all cores for compressive strength under ASTM C 42/C 42M at an authorized laboratory. The compressive strength is the average strength of the 3 cores.

Shotcrete must have a minimum compressive strength of 3,600 psi, unless otherwise described. The shotcrete must attain the minimum compressive strength at 28 days, except 42 days are allowed for shotcrete with a described minimum compressive strength greater than 3,600 psi.

^^

54 WATERPROOFING

07-19-13

Add between "be" and "3/8 inch" in the 3rd paragraph of section 54-4.02C:

04-20-12

at least

NOT FOR CONSTRUCTION

Add to section 54:

07-19-13

54-7 SILANE WATERPROOFING TREATMENT

Reserved

54-8–54-10 RESERVED

**^^^

Replace items 2 and 3 in the list in the 1st paragraph of section 55-1.01C(3) with:

07-19-13

2. Tension flanges and webs of horizontally curved girders
3. Hanger plates

Replace the 2nd paragraph of section 55-1.01C(3) with:

07-19-13

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).

Replace the 4th paragraph of section 55-1.01C(3) with:

07-19-13

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.

Replace the 1st sentence of the 6th paragraph in section 55-1.01C(3) with:

07-19-13

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).

Replace the 2nd sentence of the 4th paragraph in section 55-1.01D(1) with:

07-19-13

The calibration must be performed by an authorized repair and calibration center approved by the tool manufacturer.

Add to section 55-1.01D(1):

07-19-13

For bolts installed as snug tight, rotational capacity testing and installation tension testing are not required.

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.

NOT FOR CONSTRUCTION

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]

[a]Grades 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.

NOT FOR CONSTRUCTION

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

[a]Use hardened washers.
[b]Zinc-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

[a]Zinc-coated nuts tightened beyond snug or wrench tight must be furnished with a dry lubricant complying with supplementary requirement S2 in ASTM A 563.
[b]Hydrostatic testing will not apply.

NOT FOR CONSTRUCTION

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 ºF
Grade 50[a] (Thickness up to 2 inches)	15 at 40 ºF
Grade 50W[a] (Thickness up to 2 inches)	15 at 40 ºF
Grade 50[a] (Thickness over 2 inches up to 4 inches)	20 at 40 ºF
Grade 50W[a] (Thickness over 2 inches up to 4 inches)	20 at 40 ºF
Grade HPS 50W[a] (Thickness up to 4 inches)	20 at 10 ºF
Grade HPS 70W (Thickness up to 4 inches)	25 at -10 ºF
Grade 100 (Thickness of 2-1/2 inches or less)	25 at 0 ºF
Grade 100W (Thickness over 2-1/2 inches up to 4 inches)	35 at 0 ºF
Grade HPS 100W (Thickness of 2-1/2 inches or less)	25 at -30 ºF
Grade HPS 100W (Thickness over 2-1/2 inches up to 4 inches)	35 at -30 ºF

[a]If 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.

07-19-13

Delete the 3rd and 4th sentences in the 2nd paragraph in section 55-1.02A(5).

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.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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.

Replace the 3rd paragraph in section 55-1.03C(2) with:

07-19-13

During welding, protect bearings and bearing surfaces using authorized methods.

Replace section 55-1.03C(4) with:

07-19-13

55-1.03C(4) Continuous Members

Unless otherwise shown, structural steel girders are designed for continuity in supporting girder dead load. If erection procedures provide girder continuity for dead load, preassemble members with field joints in a no-load condition in a horizontal or an upright condition.

You may erect structural steel girders such that dead load girder continuity is not provided. If erection procedures do not provide girder continuity for dead load:

1. You may increase cross-sectional areas or change grades of steel to provide the specified capacity if authorized.
2. After erection, the erected structure must have a load-carrying capacity at least equal to the structure shown.

^^

56 SIGNS

07-19-13

Replace the 4th paragraph of section 56-3.01A with:

07-19-13

The types of sign structures include:

1. Truss
2. Bridge mounted
3. Tubular

Replace "sets" in the 1st paragraph of section 56-3.01C(2) with:

04-19-13

copies

07-20-12

Delete the 7th paragraph of section 56-3.02K(2).

NOT FOR CONSTRUCTION

Replace the 1st paragraph of section 56-3.02M(1) with:

07-19-13

Galvanize all ferrous metal parts of the following sign structure types:

1. Truss
2. Bridge mounted
3. Tubular

Add between the 1st and 2nd paragraphs of section 56-3.02M(1):

04-19-13

Clean and paint all ferrous metal parts of tubular sign structures after galvanizing, including the areas to be covered by sign panels. Do not paint sign structures other than tubular type unless specified in the special provisions.

Replace the headings and paragraphs in section 56-3.02M(3) with:

04-19-13

Where specified, clean and paint sign structures under section 59-5.

^^

57 WOOD AND PLASTIC LUMBER STRUCTURES

04-19-13

Replace "51-2.01C(3)" in the 1st paragraph of section 57-2.01C(3)(a) with:

10-19-12

57-2.01C(3)

Replace "sets" at each occurrence in the 1st paragraph of section 57-3.01C with:

04-19-13

copies

^^

58 SOUND WALLS

04-19-13

10-19-12

Delete the 3rd paragraph of section 58-1.01.

Replace the 1st paragraph of section 58-2.01D(5)(a) with:

08-05-11

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

NOT FOR CONSTRUCTION

10-19-12

Delete the 1st paragraph of section 58-2.02F.

Replace "sets" at each occurrence in the 1st paragraph of section 58-4.01C with:

04-19-13

copies

^^

59 PAINTING

11-15-13

Replace "SSPC-SP 10" at each occurrence in section 59 with:

10-19-12

SSPC-SP 10/NACE no. 2

Replace "SSPC-SP 6" at each occurrence in section 59 with:

10-19-12

SSPC-SP 6/NACE no. 3

Replace "SSPC-CS 23.00" at each occurrence in section 59 with:

10-19-12

SSPC-CS 23.00/AWS C 2.23M/NACE no. 12

Replace "*Specification for Structural Joints Using ASTM A325 or A 490 Bolts*" in the 1st paragraph of section 59-2.01C(1) with:

07-19-13

Specification for Structural Joints Using High-Strength Bolts

Replace "SSPC-QP 3 or AISC SPE, Certification P-1 Enclosed" in item 3 in the list in the 1st paragraph of section 59-2.01D(1) with:

10-19-12

AISC-420-10/SSPC-QP 3 (Enclosed Shop)

Replace "*Specification for Structural Joints Using ASTM A325 or A 490 Bolts*" in the 1st paragraph of section 59-2.02 with:

07-19-13

Specification for Structural Joints Using High-Strength Bolts

Replace the paragraphs in section 59-2.03A with:

10-19-12

Clean and paint all exposed structural steel and other metal surfaces.

You must provide enclosures for cleaning and painting structural steel. Cleaning and painting of new structural steel must be performed in an Enclosed Shop as defined in AISC-420-10/SSPC-QP 3. Maintain atmospheric conditions inside enclosures within specified limits.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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:

NOT FOR CONSTRUCTION

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

[a]If no finish coats are described, a final coat of inorganic zinc primer is required.
[b]Exterior grade latex must comply with section 91-2.02 unless otherwise specified.
[c]Includes the following locations:

1. New and existing contact surfaces
2. Existing member surfaces under new HS bolt heads, nuts, or washers
3. Bare surfaces of existing steel after trimming, cutting, drilling, or reaming
4. Areas within a 4-inch radius from the point of application of heat for welding or 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:

NOT FOR CONSTRUCTION

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

[a]Includes 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.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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

NOT FOR CONSTRUCTION

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:

04-19-13

soldier

NOT FOR CONSTRUCTION

Replace section 59-11 with:

07-19-13

59-11 STAINING GALVANIZED SURFACES

Reserved

Replace section 59-12 with:

07-19-13

59-12 ROCK STAINING

59-12.01 GENERAL

59-12.01A Summary

Section 59-12 includes specifications for applying stain to the exterior surface of landscape boulders, native rock that has been damaged or scarred, rock energy dissipaters, rock slope protection and gabion surfaces.

59-12.01B Submittals

Submit the following:

1. Work plan showing methods to control overspray and spillage, and to protect adjacent surfaces
2. Product data including the manufacturer's product sheet and the instructions for the application of the stain

59-12.01C Quality Control and Assurance

59-12.01C(1) General

Reserved

59-12.01C(2) Test Plot

Apply the stain to a test plot rock area of at least 3 by 3 feet at a location designated by the Engineer. Notify the Engineer at least 7 days before staining the test plot. Prepare and stain the test plot with the same materials, tools, equipment, and methods to be used in staining the final surfaces. Separate test plots are required for staining rock slope protection and native rock.

If ordered, prepare additional test plots. Additional test plots are change order work.

Obtain authorization of the test plot before starting the staining work. Use the authorized test plot as the standard for comparison in determining acceptability of staining. If the test plot is not incorporated into the work and the Engineer determines it is no longer needed, dispose of it.

59-12.02 MATERIALS

59-12.02A General

Reserved

59-12.02B Stain

Reserved

59-12.03 CONSTRUCTION

59-12.03A General

Reserved

59-12.03B Preparation

Before applying the stain:

1. Identify and obtain authorization for the areas to be stained
2. Remove oils, dirt, and other contaminants from the surfaces to be stained
3. Dry all surfaces to be stained

NOT FOR CONSTRUCTION

59-12.03C Application

After the areas to be stained have been identified, prepared, and the test plot authorized, stain the exposed surfaces under the manufacturer's instructions to achieve a color consistent with, or as close as possible to, the authorized test area color.

Control overspray and protect adjacent surfaces.

Keep stained surfaces dry for at least 20 days following the application of the stain.

59-12.04 PAYMENT

Rock stain areas are measured along the slope face.

^^

DIVISION VII DRAINAGE

62 ALTERNATIVE CULVERTS

07-19-13

Add to the end of section 62-1.01:

10-19-12

Alternative culverts include concrete collars and concrete tees and reinforcement for connecting new pipe to existing or new facilities. Concrete for the collars and tees must be minor concrete. Reinforcement for the concrete collars or tee connections must comply with section 52.

Add to section 62:

07-19-13

62-5 TEMPORARY SLOTTED PIPE

Reserved

62-6–62-10 RESERVED

^^

64 PLASTIC PIPE

07-19-13

Replace the 2nd paragraph of section 64-1.01A with:

10-19-12

Plastic pipe includes all necessary elbows, wyes, tees, other branches, fittings, coupling systems, concrete collars or tees, and reinforcement.

Replace item 1 in the list in the 3rd paragraph of section 64-1.02E with:

07-19-13

1. If watertight joints are shown, use Type S corrugated polyethylene pipe with gaskets. If watertight joints are not shown, use gasketed joints when specified. Gaskets for Type C corrugated polyethylene pipe must be installed on each side of the joint. Gaskets must comply with ASTM F477 and be factory-installed.

NOT FOR CONSTRUCTION

^^

65 CONCRETE PIPE

07-19-13

Replace the 2nd paragraph of section 65-1.01 with:

10-19-12

Concrete pipe includes all necessary elbows, wyes, tees, other branches, concrete collars or tees, and reinforcement.

Replace section 65-2.02D with:

07-19-13

65-2.02D Reserved

^^

70 MISCELLANEOUS DRAINAGE FACILITIES

07-19-13

Replace section 70-5.02A(2) with:

01-20-12

70-5.02A(2) Plastic Flared End Sections

Plastic flared end sections must comply with ASTM D 3350.

Replace "40-1.03N" in item 2.4 of the 1st paragraph of section 70-5.06C with:

07-19-13

40-1.03K

Replace the 2nd, 3rd, and 4th paragraphs of section 70-7.02B with:

01-18-13

Before shipping, the exterior surfaces of the casing must be cleaned, primed, and coated to comply with ANSI/AWWA C213 or ANSI/AWWA C214.

Wrapping tape for repairing damaged coating and wrapping field joints and fittings must be a pressure-sensitive PVC or polyethylene tape with a minimum thickness of 50 mils, 2 inches wide.

Add to section 70-7.03:

01-18-13

Repair damaged coating on the casing and wrap field joints and fittings with wrapping tape as follows:

1. Before wrapping, thoroughly clean and prime the pipe casing, joints, and fittings under the tape manufacturer's instructions.
2. Wrap the tape tightly with 1/2 uniform lap, free from wrinkles and voids to provide not less than a 100-mil thickness.
3. Wrapping at joints must extend at least 6 inches over adjacent pipe casing coverings. Apply tension such that the tape will conform closely to contours of the joint.

NOT FOR CONSTRUCTION

Add to section 70:

07-19-13

70-8–70-15 RESERVED

^^

DIVISION VIII MISCELLANEOUS CONSTRUCTION

72 SLOPE PROTECTION

11-15-13

Replace the table in the 3rd paragraph of section 72-2.02A with:

11-15-13

Rock Material Properties

Property	California Test	Value
Apparent specific gravity	206	2.5 minimum
Absorption	206	4.2% maximum
Durability Index	229	52 minimum

Notes:
Durability absorption ratio (DAR) = course durability index/(% absorption + 1)
If the DAR is greater than 10, the absorption may exceed 4.2 %
If the DAR is greater than 24, the durability index may be less than 52

Replace the row under "Class" in the table in the 1st paragraph of section 72-3.02B with:

01-20-12

1/2 T	1/4 T	Light	Facing	Cobble

Replace the table in the 2nd paragraph of section 72-3.02B with:

11-15-13

Rock Material Properties

Property	California Test	Value
Apparent specific gravity	206	2.5 minimum
Absorption	206	4.2% maximum
Durability index	229	52 minimum

Notes:
Durability absorption ratio (DAR) = course durability index/(% absorption + 1)
If the DAR is greater than 10, the absorption may exceed 4.2 %
If the DAR is greater than 24, the durability index may be less than 52

Replace the row under "Rock class" in the table in the 2nd paragraph of section 72-3.03E with:

01-20-12

1/2 T	1/4 T	Light	Facing	Cobble

NOT FOR CONSTRUCTION

07-19-13

Delete the 5th and 6th paragraphs of section 72-11.01B.

Add to section 72-11.01B:

01-18-13

Expanded polystyrene and premolded expansion joint filler must comply with section 51-2.

07-19-13

Delete the 2nd paragraph of section 72-11.01C(1).

07-19-13

Delete the 7th paragraph of section 72-11.01C(1).

Add between the 7th and 8th paragraphs of section 72-11.01C(1):

07-19-13

Schedule the construction of the slope paving such that the work, including placing and finishing concrete and applying curing compound, is completed on the same day that the work is started.

Replace the 8th paragraph of section 72-11.01C(1) with:

07-19-13

If the Engineer determines that the size of the slope paving is too large to be constructed without an intermediate construction joint, place a joint at an authorized location. Complete a section of concrete bounded by permissible construction joints within the same day.

Replace the 1st paragraph of section 72-11.01C(2) with:

01-18-13

Construct and finish minor concrete slope paving under section 51-1.

Replace the 3rd paragraph of section 72-11.01C(2) with:

07-19-13

After striking-off to grade, hand float the concrete with floats that are at least 4 inches wide and 30 inches long. Broom the entire surface with a stiff-bristled broom to produce a uniform surface. Brooming must be done when the surface is sufficiently set to prevent deep scarring and must be accomplished by drawing the broom down the slope, leaving marks parallel to the slope. The Engineer may order you to apply a fine spray of water to the surface immediately before brooming.

07-19-13

Delete the 3rd paragraph of section 72-11.01D.

**^^^

73 CONCRETE CURBS AND SIDEWALKS

07-19-13

Replace the paragraph in section 73-1.01A with:

07-19-13

Section 73-1 includes general specifications for constructing minor concrete items including concrete curbs, sidewalks, gutter depressions, driveways, island paving, and curb ramps; for installing detectable warning surfaces and precast parking bumpers; and for texturing and coloring concrete surfaces.

^^

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.

^^

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

^^

NOT FOR CONSTRUCTION

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

^^

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.

NOT FOR CONSTRUCTION

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 mesh and wire will be exerted. Terminate the wire mesh and barbed wire at each end, corner, pull, and gate post in the new fence line. Attach wire mesh and barbed wire to each wood or steel end, corner, pull, or gate post by wrapping each horizontal strand around the post and tying it back on itself with at least 4 tightly-wound wraps.

At line posts, fasten the wire mesh to the post at the top and bottom and at intermediate points not exceeding 10 inches apart. Fasten each line of barbed wire to each line post. Use wire ties or clips to fasten the wires to metal posts under the post manufacturer's instructions. Drive staples crosswise with the grain of the wood and pointed slightly downward. Drive staples just short of actual contact with the wires to allow free longitudinal movement of those wires and to prevent damage to the wire's protective coating. Secure all wires to posts to maintain horizontal alignment.

Splices in barbed wire and wire mesh are allowed provided there are no more than 2 splices per 50 feet of fence. Use commercially-available galvanized mechanical wire splices or a wire splice created by tying off wire. Install mechanical wire splices with a tool designed for that purpose under the manufacturer's instructions. Tie off the wire as follows:

1. Carry the ends of each wire 3 inches past the tied-off knot location and wrap around the wire for at least 6 turns in opposite directions.
2. Remove the splice tool and close the space by pulling the end of the wires together.
3. Cut the unused ends of the wire close and neat.

Add to "≤ 6" in the table in the 4th paragraph of section 80-3.02B:

10-19-12

feet

^^

DIVISION IX TRAFFIC CONTROL FACILITIES

83 RAILINGS AND BARRIERS

11-15-13

Replace "metal beam guard railing" at each occurrence in sections 83-1.02 and 83-1.03 with:

07-19-13

midwest guardrail system

Replace "guard rail" and "guard railing" at each occurrence in sections 83-1.02A and 83-1.02B with:

07-19-13

guardrail

NOT FOR CONSTRUCTION

Replace the heading of section 83-1.02B with:

07-19-13

Midwest Guardrail System

Add between "splices at" and "posts" in the 5th paragraph of section 83-1.02B:

07-19-13

midspan between

Replace "Metal rail posts, box spacers, and" in item 1 in the list in the 25th paragraph of section 83-1.02B with:

07-19-13

Metal box spacers and

07-19-13

Delete items 6 and 7 in the list in the 25th paragraph of section 83-1.02B.

Replace "Type WB" at each occurrence in section 83-1.02B(2) with:

07-19-13

Type WB-31

Replace the heading of section 83-1.02B(3) with:

07-19-13

Temporary Midwest Guardrail System

Replace "80-2.02" in the 2nd paragraph of section 83-1.02E with:

10-19-12

80-3.02B

Replace "sets" in the 10th paragraph of section 83-1.02G(2) with:

07-19-13

copies

Replace the 1st sentence of the 1st paragraph of section 83-1.03 with:

11-15-13

Except for guardrail within the pay limits of a terminal system, a transition railing (Type WB-31), an end anchor assembly, or a rail tensioning assembly, midwest guardrail system is measured along the face of the rail element from end post to end post of the completed railing.

Add to section 83-2.02D(1):

10-21-11

For a concrete barrier transition:

1. Remove portions of the existing concrete barrier where shown under section 15-3

NOT FOR CONSTRUCTION

2. Roughen the contact surface of the existing concrete barrier
3. Drill and bond dowels into the existing concrete barrier under section 51-1

Add to section 83-2.02:

10-19-12

83-2.02H–83-2.02M Reserved

^^

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

^^

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.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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

NOT FOR CONSTRUCTION

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.

07-19-13

Delete the row for standard Type 36-20A in the table in the 6th paragraph of section 86-2.04B(2).

Replace the 10th paragraph of section 86-2.04B(2) with:

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.

07-19-13

Delete item 15.3 in the list in the 1st paragraph of section 86-2.04B(3).

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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

25×10^{13} Ω per inch, minimum

Add between "the" and "head" in the 3rd sentence of the 2nd paragraph of 86-2.09F:

07-19-13

connector

Replace "project" in the 3rd paragraph of section 86-2.11A with:

10-19-12

work

Replace "Contract" in item 2 in the list in the 11th paragraph of section 86-2.11A with:

10-19-12

work

07-19-13

Delete the 12th paragraph of section 86-2.11A.

Replace section 86-2.11C with:

07-19-13

86-2.11C Electrical Service for Booster Pumps

Provide electrical service from the service point to the booster pump.

Furnish conductors, conduit, and pull boxes from the service point to the booster pump.

Do not use Type 3 conduit unless shown otherwise.

NOT FOR CONSTRUCTION

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:

07-19-13

The Department furnishes the BBS components under section 6-2.03.

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

07-19-13

Delete item 1.3 in the list in the 7th paragraph of section 86-3.04A.

Replace the 2nd paragraph of section 86-4.01A with:

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

NOT FOR CONSTRUCTION

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.

07-19-13

Delete item 1 in the list in section 86-4.01D(1)(b).

Replace the paragraphs in section 86-4.01D(1)(c)(i) with:

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:

07-19-13

The electrical connection for each flashing LED signal module must be 4 secured, color-coded, jacketed copper wires. The wire must comply with the NEC.

Replace the heading of section 86-4.02 with:

07-19-13

PROGRAMMED VISIBILITY VEHICLE SIGNAL SECTION

Replace "face" in the 1st paragraph of section 86-4.02 with:

07-19-13

section

Add before the 1st sentence in section 86-4.03A:

07-19-13

The pedestrian signal face must be Type A.

Replace the 1st sentence of the 2nd paragraph of section 86-4.03B with:

07-19-13

The Department tests the pedestrian signal's front screen in a horizontal position with its edges supported.

NOT FOR CONSTRUCTION

07-19-13

Delete items 1 and 4 in the list in section 86-4.03I(1)(b).

Replace the paragraphs of section 86-4.03I(1)(c)(i) with:

07-19-13

The LED PSF module must be on the Authorized Material List for LED traffic signals.

The Department tests LED PSF modules under section 86-2.14A, ANSI/ASQ Z1.4, and California Test 606.

The LED PSF modules submitted for testing must be representative of typical production units.

The Department may test the modules on all parameters specified in section 86-4.03I.

Replace item 1 in the list in the 1st paragraph of section 86-4.03I(2) with:

07-19-13

1. Not include reflectors.

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

07-19-13

Delete "face" in item 1 in the list in the 1st paragraph of section 86-4.05.

Replace the row for viscosity in the table in the 2nd paragraph of section 86-5.01A(3)(c) with:

07-19-13

Viscosity, Brookfield Thermosel, no. 27 Spindle, 20 rpm, 190 °C	D 4402	2.5–3.5 Pa·s

NOT FOR CONSTRUCTION

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 section 86-5.02 with:

07-19-13

86-5.02 PUSH BUTTON ASSEMBLIES

The housing for a push button assembly must be die-cast or permanent mold-cast aluminum. The assembly must be rainproof and shockproof in any weather condition.

The push button's switch must be a single-pole, double-throw switching unit with screw-type terminals rated 15 A at 125 V(ac). The switch must have:

1. Plunger actuator and a U frame to allow recessed mounting in the push button housing
2. Operating force of 3.5 lb
3. Maximum pretravel of 5/64 inch
4. Minimum overtravel of 1/32 inch
5. Differential travel from 0.002 to 0.04 inch
6. 2-inch minimum diameter actuator

Where a push button is attached to a pole, the housing must be shaped to fit the pole's curvature. Use saddles if needed to make a neat and secure fit.

Where a push button is mounted on top of a 2-1/2-inch-diameter post, fit the housing with a slip fitter and use screws to rigidly secure it to the post.

Install the push button and the sign on the crosswalk side of the pole.

Attach the sign on a Type B push button assembly.

For a Type C push button assembly, mount the instruction sign on the same standard as the assembly using 2 straps and saddle brackets.

Add to section 86-5:

07-19-13

86-5.03 ACCESSIBLE PEDESTRIAN SIGNAL

Reserved

NOT FOR CONSTRUCTION

Replace "lthe amp" in item 2 in the list in the 1st paragraph of section 86-6.01A(2) with:

07-19-13

the lamp

^^

DIVISION X MATERIALS

88 GEOSYNTHETICS

07-19-13

Add to section 88-1.01C:

07-19-13

Geosynthetics must be on the DataMine list for geotextiles and geosynthetics at the National Transportation Product Evaluation Program Web site. The product name, manufacturing source, and date of manufacture must be printed every 5 meters along the edge of the material.

Exceptions are:

1. Paving mat
2. Paving grid, Class 2 and 3
3. Biaxial geogrid

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

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

NOT FOR CONSTRUCTION

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:

NOT FOR CONSTRUCTION

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

[a]Machine direction x cross direction
[b]Geosynthetic 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

^^

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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.

NOT FOR CONSTRUCTION

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

[a]Percent fines under 75 microns test replaces the cleanness test in section 90-1.02C with the requirements of 1.5 percent maximum for "Operating Range" and 2.0 percent maximum for "Contract Compliance." The 5th paragraph of section 90-1.02C(2) does not apply.

[b]Electronically actuated moisture meter must be calibrated once per week per ASTM C566.

NOT FOR CONSTRUCTION

Concrete QC Tests

Property	Test method	Minimum testing frequency
Compressive strengthb	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

[a]ASTM C173/C173M must be used for lightweight concrete.
[b]Cylinders must be 6 by 12 inches.

If concrete is batched at more than 1 plant, perform the tests at each plant.

Cure test cylinders for determining time of prestressing loading in the same manner as the concrete in the member.

Cure test cylinders for determining compliance with 28-day strength requirements in the same manner as the member until completion of the steam curing process followed by a water bath or moist room at 60 to 80 degrees F until tested.

For PC concrete that is steam cured, concrete designated by compressive strength is acceptable if its compressive strength reaches the described 28-day compressive strength in no more than the maximum number of days specified or allowed after the concrete is cast.

90-4.01D(3) Quality Assurance

For PC concrete that is steam cured, the Engineer evaluates the compressive strength based on individual tests representing specific portions of production.

Add between the 1st and 2nd paragraphs of section 90-4.02:

07-19-13

PC portland cement based repair material must be on the Authorized Material List.

If municipally supplied potable water is used for PC concrete, the testing specified in section 90-1.02D is waived unless requested.

NOT FOR CONSTRUCTION

Add to section 90-4.03:

07-19-13

For dimensional tolerances of PC concrete members, comply with the Precast/Prestressed Concrete Institute Concrete Institute's *Tolerance Manual for Precast and Prestressed Concrete Construction, MNL 135-00*.

For tier 1 and tier 2 PC concrete members, apply curing compound using power-operated spraying equipment. You may request application by hand spraying for small quantities of PC concrete members. For tier 3 and tier 4 PC concrete members, the application of curing compound may be hand sprayed.

Replace the item 2 in the list in the 2nd paragraph of section 90-4.03 with:

07-19-13

2. To prevent moisture loss on the exposed surfaces during the presteaming period, cover the concrete as soon as possible after casting or keep the exposed surfaces wet by fog spray, curing compound, or wet blankets.

^^

91 PAINT

10-19-12

Add to section 91-2:

10-19-12

91-2.03 MOISTURE-CURED POLYURETHANE COATING

Reserved

Replace "saint" in the 1st paragraph of section 91-4.05 with:

10-19-12

paint

^^

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 min G*/sin(delta), kPa max G*/sin(delta), kPa	T 315	58 1.00 2.00	64 1.00 2.00	64 1.00 2.00	64 1.00 2.00	70 1.00 2.00

NOT FOR CONSTRUCTION

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[f], 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

NOT FOR CONSTRUCTION

[a]The 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.
[b]Report only for spray application.
[c]The 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.
[e]Test temperature is the temperature at which G*/sin(delta) is 2.2 kPa. A graph of log G*/sin(delta) plotted against temperature may be used to determine the test temperature when G*/sin(delta) is 2.2 kPa. A graph of (delta) versus temperature may be used to determine delta at the temperature when G*/sin(delta) is 2.2 kPa. The graph must have at least two points that envelope G*/sin(delta) of 2.2 kPa and the test temperature must not be more than 6 degree C apart. The Engineer also accepts direct measurement of (delta) at the temperature when G*/sin(delta) is 2.2 kPa.
[f]Tests without a force ductility clamp may be performed.
[g]"PAV" means "Pressure Aging Vessel."

Do not modify PG modified asphalt binder using polyphosphoric acid.

Crumb rubber must be from automobile and truck tires and must be free from contaminants including fabric, metal, minerals, and other nonrubber substances.

PG modified asphalt binder modified with crumb rubber must be homogeneous and must not contain visible particles of crumb rubber.

The supplier of PG modified asphalt binder modified with crumb rubber must:

1. Report the amount of crumb rubber by weight of asphalt binder
2. Certify a minimum of 10 percent of crumb rubber by weight of asphalt binder

^^

93 LIQUID ASPHALTS

07-19-13

Replace "Celsius" the 1st row in the table in the 8th paragraph of section 93-1.04 with:

07-19-13

Fahrenheit

NOT FOR CONSTRUCTION

APPENDIX A
PERMITS

NOT FOR CONSTRUCTION

NOT FOR CONSTRUCTION