



STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

PROJECT REQUIREMENTS
BOOK 2

**FOR DESIGN AND CONSTRUCTION ON STATE HIGHWAY IN
MADERA COUNTY IN AND NEAR MADERA FROM 0.3 MILE SOUTH
OF SOUTH MADERA OVERCROSSING TO 0.4 MILE
NORTH OF AVENUE 16 OVERCROSSING**

DISTRICT 06, ROUTE 99

**For Use in Connection with Standard Specifications Dated JULY 2006, Standard Plans Dated JULY 2006, and Labor
Surcharge and Equipment Rental Rates.**

CONTRACT NO. 06-0E0404

06-Mad-99-9.5/13.1

Project ID 0600000043

Federal Aid Project

NH-P099(538)N

Dated: February 1, 2011

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1 GENERAL

1.1 General

The Contractor shall perform all Work necessary to meet the requirements of the Contract.

1.2 Introduction to Books 2 and 3

This introduction is intended to provide instructions to the Contractor on the relationship between Books 2 and 3. It does not replace the order of precedence set forth in Book 1. Book 1, Section 1.3 defines the order of precedence for the Contract Documents. If there are any conflicts between this introduction and Book 1, Section 1.3, Book 1 shall control.

Book 3 sets forth the standards applicable to the Project. Some standards have been modified for application to the Contract. Those modified standards are identified in Book 3. Book 3 includes Technical Memoranda that modify the Department's Manuals and Special Provisions that modify the Department's Standard Specifications. Any Department Special Provisions or Technical Memoranda not included in Book 3 shall not be used by the Contractor without prior Approval of the Department. In some instances, only specific sections of the given standard apply. These sections are specified in Book 2.

Book 2 sets forth requirements that are intended to apply to this Project. Book 2 incorporates the standards in Book 3 by reference. In many cases, Book 2 will modify, supplement, or replace the standards in Book 3.

The text of Book 2 shall take higher precedence than the exhibits of Book 2, unless otherwise specified.

1.3 Project Description

1.3.1 Basic Configuration

The Preliminary Design Drawings provided in the Reference Information Documents (RID) convey the general intent of the Project. The Basic Configuration means those portions of the Preliminary Design Drawings that depict:

1. Horizontal alignment
 - The project has horizontal curve and vertical curve.
2. Lane and shoulder widths.
 - Two 12-foot wide lanes in each direction, northbound (NB) and southbound (SB). The outside shoulder is 10 feet wide and the inside shoulder is 5 feet wide with a paved median.
3. Number of lanes.
 - 4-lane freeway with two lanes in each direction.
4. Location and number of roadway access points
 - The access points for the freeway within the project limits are:
 - **Northbound**
 - Gateway Drive off ramp
 - Madera Avenue/Route 145 off ramp
 - Madera Avenue/Route 145 on ramp
 - 4th Street off ramp
 - 2nd Street on ramp

- Cleveland Avenue off ramp
- Cleveland Avenue on ramp
- Avenue 16 off ramp
- Avenue 16/Gateway Drive on ramp
- **Southbound**
 - Avenue 16 off ramp
 - Avenue 16 on ramp
 - Cleveland Avenue off ramp
 - Cleveland Avenue on ramp
 - 2nd Street off ramp
 - 4th Street on ramp
 - Madera Avenue/ Route 145 off ramp
 - Madera Avenue/ Route 145 on ramp
- 5. Median type.
 - Median prevailing width is at 40 feet from edge of traveled way (ETW) to ETW. The clearance varies from edge of travel to the face of median concrete barrier. The narrowest location is under the Madera Underpass railroad bridge due to oversized column with barrier. The median is paved with 2-inch thick asphalt concrete. There is an existing concrete barrier at the center of the median with a 5-foot inside shoulder in both directions.
- 6. Approximate location of Project limits.
 - The project limits are from Post Mile 9.5 to Post Mile 13.1.

1.3.2 Project Limits

The Project is located in Madera County in the City of Madera. The Project limits are as follows:

- From Post Mile 9.5 to Post Mile 13.1
- In and near Madera from 0.3 mile south of South Madera Overcrossing bridge.
- To 0.4 mile North of Avenue 16 Overcrossing Bridge.

The lateral limits of the Project shall extend to the locations necessary to complete the Work and meet the Project requirements. Lateral limits on cross streets shall be as needed to tie Work on Route 99 into the existing cross-street, to a line perpendicular with the cross street curb return, or to the extent necessary to construct drainage facilities, whichever is more extensive.

1.3.3 General Description

The Design-Builder shall not rely on the physical description contained in this Section 1 to identify all Project components. The Design-Builder shall determine the full scope of the Project through thorough examination of the RFP and the Project Site, or as may be reasonably inferred from such examination.

- The Project is to replace the existing concrete panels with hot mix asphalt. The locations of panel replacement are from post mile 9.5 to Post-Mile 10.0 and from Post Mile 11.7 to Post Mile 13.1. A typical panel dimension is 12ft x 15ft. The quantities and location are shown in reference drawing Q-1. Design-Builder need to coordinate with the Department for locations of panels. Department in-charge to contact Department maintenance pavement management personnel to finalize locations.

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- From post mile 10.0 to 11.6, remove the existing Portland cement concrete (PCC) pavement and a 0.35' asphalt concrete overlay on top in lane No. 2. Construct a 14' wide continuous re-enforced concrete pavement. Remove the 10' existing outside shoulder and replace with 8' wide hot mix asphalt concrete shoulder.
 - From post mile 10.0 to post mile 11.6. Rebuild the median with a 12' Joint Plain Concrete Pavement (JPCP) from edge of travel way with 2% slope towards the concrete barrier. Replace lane no.1 with Joint Plain Concrete Pavement (JPCP). All concrete lanes shall be design supported.
 - No work on the deck of Fresno River Bridge (PM 11.6 to 11.7).

The Project will include:

- Cold Plane 0.35 thick of Asphalt Concrete pavement from PM. 9.5 to 10.0 and PM. 11.7 to 13.1. Overlay dense grade 0.1' hot mix asphalt (type A), Place SAMI-R (stress absorbing membrane interlayer, rubberized) and overlay with 0.5 ft. dense graded hot mix asphalt (type A).
- Construct rumble strips on the inside and outside AC shoulders between Post mile 9.5 to 10.0 And Post mile 11.7 to 13.1
- Upgrade all existing guard rail to current standards within the project limits.
- Construct a new metal beam guard rail to shield the existing census control box on the right side of Route 99
Location: North of southbound off-ramp to Route 145.
- Modify lighting and sign illumination at the following approximate locations (PM 9.52, 10.03 to 10.2, 10.5 to 10.5, 10.8 to 11.0, 11.2 to 11.3, 11.9 to 12.0, 12.3 to 12.3, 12.6 to 12.7, 13.0 and to 13.1.
- Modify Traffic Monitoring Station at the following approximate locations PM (9.8, 10.2, 10.6, 11.2, 11.6, 12.1 to 12.2, 12.5, and 12.8)
- Closed circuit Television System at these approximate locations (PM 9.8,10.8,)
- Changeable Message Sign System (CMS). Model 500 CMS with led sign. Design foundation and post will determined by Design Builder. (PM 10.5)
- Modify Roadside Weather Information system. Replace the existing sensor and install a new sensor with a surface probe
- Add count loops to all On and Off Ramps and tie into existing Traffic monitoring system.
- Add piezo's on the existing count loops on Route 99 mainline both Northbound and Southbound
- Ensure to upgrade all traffic signs within the project limits are to current standards.
- Install a drainage system under the Ave. 16 Bridge on the northbound side by the shoulder to drain to the outside of the roadway.
- Replace all Type A dike with Type E.
- Place temporary and permanent striping and signing
- Maintain two 12' lanes open during construction in both direction
- Night time closure to one lane permitted per lane closure chart
- Maintain existing roadway profile and vertical clearance under the bridges
- Need to have a 1'0 shoulder on each side of temporary detour lane.

- Within the project Location there are three pump house with a storage box under the Freeway
Cleveland Ave. Pump house Post Mile 12.1
Route 99/145 Pump house Post Mile 10.3
Madera 99 undercrossing pump house Post Mile 11.1

1.3.4 Cooperation

Attention is directed to Section 7-1.14, Cooperation,” and Section 8-1.10, “Utility and Non-Highway Facilities,” of the Standard Specifications and these special provisions.

It is anticipated that work by other contractors on the following projects may be in progress adjacent to or within the limits of this project during progress of the work on this contract:

- 06-40721 Mad 145, 8.8/9.1 Post Miles, Widen Bridge In Madera County In Madera On Route 99 And On Route 145.
- 06-42530 Mad 99, 13.1 Post Miles, Construct New Bridge On Route 99 Between Avenue 16 Interchange And Avenue 17 Interchange.
- Design Builder to coordinate with the City Engineer of City Madera for the closure of On-ramp and Off-ramp on the northbound southbound during construction.

2 PROJECT MANAGEMENT

2.1 Scope Management

2.1.1 General

The Design-Builder shall perform all Work necessary to meet the requirements of scope management, including preparing, documenting, revising, and submitting information that details the Work and changes to the Work.

2.1.2 Administrative Requirements

Following NTP1, the Design-Builder shall structure its project management processes, including payment breakdown on invoices and file structure for document control according to the activity breakdown provided in the Project Schedule.

The Design-Builder shall schedule, conduct, prepare, and distribute the minutes of an overall Project preconstruction conference.

2.1.3 Deliverables

The Design-Builder shall submit the Project preconstruction conference minutes to the Department within seven Days after the preconstruction conference.

2.2 Cost Management

2.2.1 General

The Design-Builder shall perform all Work necessary to meet the requirements of cost management, including the preparing, processing, revising, and submitting of invoices and progress reports.

2.2.2 Administrative Requirements

2.2.2.1 Payment Breakdowns

Following NTP1, the Design-Builder shall develop a payment breakdown based on Form 9 of the RFP and the activity breakdown in the Project Schedule. This breakdown shall be documented in an Original Payment Breakdown.

The Design-Builder shall ensure that all costs necessary to meet the particular requirements of each item are included in the payment breakdown.

During the course of the Project, the Design-Builder shall incorporate any Approved changes to the payment breakdown and document the new payment breakdown in a Revised Payment Breakdown.

In all payment breakdowns, the Design-Builder shall show the total cost per item and the cost per billing period for each item.

The Design-Builder shall ensure that all cost breakdowns are consistent and total up to the Contract Price.

2.2.2.2 Invoices

2.2.2.2.1 General

The Department reserves the right to withhold processing of an invoice if the requirements of this section are not met.

The Design-Builder shall structure the billing periods to start on the first day of the month and end on the last day of the month. The Design-Builder shall include the following on the invoice cover sheet:

- Project numbers (Federal and State) and title
- Invoice number (numbered consecutively starting with “01”)
- Period covered by the invoice (specific Days)
- Total earned to date for the Project as a whole and for each Work Segment, if any
- Authorized signature and title of signatory
- Date that invoice was signed

The Design-Builder shall include the Progress Report, for the period being billed, with the invoice.

On a monthly basis, at a minimum, the Design-Builder shall meet with the Department to review the following prior to submitting invoices:

- Activity percent completes, which are based on physical percent complete estimated by the field personnel relating to a resource and cost loaded schedule activity
- Incorporation of approved Change Orders as individual activities with proper title, coding by Change Order number, associated logic, duration, as well as cost/resource loading
- Verification of any unit price items
- Status of outstanding Nonconforming Work and Warranties
- Backup documentation for cost reimbursable procurement and Change Order schedule activities

2.2.2.2.2 Invoice Calculations

The Department will base payments on the Department’s estimate of physical percent complete of the Work, not on measured quantities (except where specifically stated in the Contract).

The payment to the Design-Builder will be the amount shown on the Design-Builder’s Approved invoice less deductions made by the Department.

The following Project Management items from Form 9 submitted with the price proposal will be paid by prorating any unpaid balances by the amount of time remaining until Substantial Completion:

- Contract Management (includes Scope Management, Cost Management, and Schedule Management)
- Quality Management
- Safety Management
- Public Information Management
- Environmental Management
- Maintenance During Construction
- Insurance (no payment will be made for insurance until insurance invoices are provided)
- Bonds

The Department makes the partial payments under Public Contract Code § 10264.

- The Department pays the item total for mobilization in excess of 10 percent of the total bid in the first payment after Final Acceptance. .

Earned value does not include the costs of bonds, insurance and prior mobilization payments.

The Department will base payments for design based on estimated percentage complete for each Release for Construction (RFC) package with the following limitations:

- A maximum 90 percent will be paid when RFC Documents have been issued.
- A maximum of 95 percent will be paid when all construction Work associated with each RFC package is complete.
- A maximum of 100 percent will be paid when all As-Built and Project History File Documents have been accepted.

2.2.2.3 Progress Report

The Design-Builder shall include the following in a monthly progress report:

1. Summary of work performed during the previous month. Include digital color photographs of the Project progress.
2. Safety
 - Summary of Project accidents (frequency and severity) and corrective actions taken
 - Updates to emergency services access points to the Project Site
 - Updates on safety training provided
3. Labor compliance
 - The total monthly labor hours for construction/maintenance and non-construction personnel by classification of management, engineering, and other technical personnel used on the job.
 - Disadvantaged Business Enterprise (DBE) and Underutilized Disadvantaged Business Enterprise (UDBE) progress and Project updates
 - Equal Employment Opportunity (EEO) progress and Project updates
 - Update on labor compliance unresolved issues
4. Quality updates
 - Summary of quality audits and quality control processes performed
 - Listing of non-conformances and resolutions
 - Summary of Quality Manual updates
5. Public Information updates
 - Summary of public input received and responses
 - Summary of media contacts
 - Summary of complaints and resolution
6. Environmental compliance
 - Summary and copies of environmental monitoring reports
 - Summary of non-compliance issues and resolution
 - Summary of agency inspections
7. Utilities
 - Status of private utility work performed and required
 - Status of public utility work performed and required

8. Geotechnical

- Summary of vibration and settlement monitoring activities and issues
- Copies of vibration monitoring reports
- Copies of settlement monitoring reports

9. Maintenance of Traffic

- Summary of traffic switches and a look ahead to future traffic switches
- Summary of known traffic incidents within the Work zone

10. Visual Quality

- Summary of visual quality activities
- Summary of recommendations and decisions

11. Change Orders

- Summary of outstanding change orders

2.2.3 Deliverables

2.2.3.1 Invoices

The Design-Builder shall include with the monthly invoice an electronic copy of the billing spreadsheet, and an updated schedule in an electronic media compatible with the Department's software.

2.2.3.2 Monthly Progress Reports

The Design-Builder shall provide six hardcopies of the Monthly Progress Report and an electronic pdf copy.

2.2.3.3 Original Payment Breakdown

The Design-Builder shall submit for the Department Acceptance the Original Payment Breakdown for Approval as a condition of NTP2. The Department will respond within 20 Working Days of receipt of the Original Payment Breakdown.

2.2.3.4 Revised Payment Breakdown

The Design-Builder shall submit the Revised Payment Breakdown for the Department Acceptance of any change to the Payment Breakdown. The Department will respond within 20 Working Days of receipt of the Revised Payment Breakdown.

2.2.3.5 Design Breakdown Report

Within 30 Days of NTP1, the Design-Builder shall provide a breakdown of the design hours and design costs for the Project in accordance with the following:

- The breakdown shall be provided in an electronic Excel spreadsheet.
- The breakdown shall list all major design activities. At a minimum, the breakdown should be broken down to a level of detail consistent with the Baseline CPM schedule.
- The breakdown shall list hours and rates per activity for each employee classification (e.g., Technicians, Senior Engineers, Project Managers, Administration).
- The breakdown shall list budgeted expenses per activity.
- The breakdown shall list a combined mark-up factor for overhead and profit.

- The spreadsheet shall sum the design activities, hours per activity, expenses, and overhead/profit mark-up into a single Lump Sum value equal to Form 9, Line 9 – Design Services.

2.3 Schedule Management

Schedule Management shall be in accordance Section 8-1.04 (Progress Schedule) of the Caltrans Standard Specifications.

2.4 Quality Management

2.4.1 General

2.4.1.1 Design-Builder Responsibility

The Design-Builder shall develop, implement, and maintain a Quality Program (QP) meeting the requirements of this Section 2.4. The QP shall be comprised of the Design-Builder's quality policy, quality objectives, design and construction quality plans, quality procedures, Work instructions, and records.

The Design-Builder shall be responsible for all Work for the design and construction quality of the Project and for fully complying with the Project's scope of Work and the Design-Builder's Quality Program (QP).

2.4.1.2 Department Role

The Department will assure the Design-Builder's Quality Program is effective.

2.4.1.3 Quality Management Goals

2.4.1.3.1 Integrated Program

The Design-Builder shall develop, implement, and maintain a Quality Program that:

- Establishes comprehensive quality management processes and procedures.
- Integrates the quality goals of both the design and construction elements of the Project.
- Defines the minimum standards and procedures for quality management.
- Assigns the responsibilities for specific quality management functions.

2.4.1.3.2 Design Quality Management

The Design-Builder shall develop, implement, and maintain a Design Quality Management Plan that includes the following:

- Exhibits sound Design Quality Control and Quality Assurance review processes.
- Ensures the Released for Construction Documents meet the requirements of the Contract.
- Provides quality measures and encourages continuous improvement of the design deliverable products.
- Involves the Department throughout the entire design development process.
- Integrates local and regulatory agencies and other applicable third parties in the design review comment process.

2.4.1.3.3 Construction Quality Management

The Design-Builder shall develop, implement, and maintain a Construction Quality Management plan that:

- Provides quality measures and encourages continuous improvement of the construction phase.
- Educates all construction staff of their role in the quality management program and ensures they understand their role is to build the Work in accordance with the Released for Construction Documents and the Project requirements.
- Ensures all construction quality assurance staff understand their role is to determine whether the Work meets the Project requirements.
- Integrates all Subcontractors and Suppliers in the construction quality management plan.
- Involves the Department throughout the entire construction process.

2.4.1.3.4 Continuous Improvement

The Department expects Quality Program improvements throughout the delivery of the entire Project. It is of the utmost importance that the Design-Builder involves all of its staff and partners with the Department to ensure overall Project satisfaction.

2.4.1.3.5 Flexibility

The description of the Quality Program in this Section is not intended to be all encompassing, but to give the Design-Builder and the Department the flexibility to design and develop a program that best fits the needs of the Project and both parties.

2.4.2 Administrative Requirements

2.4.2.1 Standards

In the event of a conflict among the standards set forth in Book 3 relating to quality management, the order of precedence shall be as set forth below, unless otherwise specified:

- Special Provisions*
- Amendments to the Standard Specifications
- Department Standard Specifications
- Standard Plans
- Department Technical Memoranda
- Department *CADD Manual**
- AASHTO/NSBA *Steel Bridge Collaboration—Shop Detail Drawing Review/Approval Guidelines*
- AASHTO/NSBA *Steel Bridge Collaboration—Shop Detail Drawings Presentation Guidelines*
- AASHTO/NSBA *Steel Bridge Collaboration—Steel Bridge Fabrication QC/QA Guide Specification*
- Remaining standards set forth in Book 3

*Document modified for design-build.

2.4.2.2 Quality Approach

The overall quality approach defined by this Section requires the Design-Builder to develop, implement, and maintain a Quality Program that encompasses the design and construction quality aspects, as well as documentation requirements for the Project. The Department will audit the Design-Builder's Quality Program to determine whether quality activities are being carried out and implemented effectively.

The Design-Builder shall perform Quality Control and Quality Assurance activities for the design of the Project in accordance with the policies and procedures defined in the Quality Manual

described in Section 2.4.2.3. The Department's oversight role will include review and audits of the design products.

The Design-Builder shall perform construction quality testing and inspection activities to ensure that materials and the constructed Work meet Contract requirements. The Design-Builder shall perform tests and inspections in accordance with the policies and procedures defined in the Quality Manual. The Department will perform contract acceptance testing and inspection for verification that the Work meets Contract requirements.

The Design-Builder shall document quality activities and maintain quality data in accordance with the policies and procedures defined in the Quality Manual. The Design-Builder shall provide a web-based Document Control System (DCS) to store and record all documents generated under the Contract for document management. The Design-Builder shall enter all Project documents including documentation of quality activities, tests, inspections, plans, reports, and correspondence into the DCS.

2.4.2.3 Quality Manual (QM)

2.4.2.3.1 Quality Manual – General

The Design-Builder's Quality Program shall include a Quality Manual (QM). The Quality Manual shall encompass all Contract requirements with regard to design, construction, and documentation requirements for all quality processes. The Quality Manual shall be approved and endorsed by the Design-Builder's established executive management committee.

The Department will deliver its approval or disapproval of and comments on each QM submittal within fifteen Working Days following the Department's receipt of the QM. The Department shall approve the Quality Manual prior to start of any work and shall be in effect until all requirements of the Contract have been fulfilled and the Project is accepted.

The Design-Builder shall revise its Quality Manual and its implementation when either the Design-Builder or the Department identifies a systemic problem. These revisions shall be approved in writing by the Department prior to implementation.

The structure of the documents describing the Quality Manual shall be: Quality policy (for the entire Quality Program), quality objectives, policies (for each element of the Quality Manual), procedures, forms and work instructions.

The Quality Manual shall graphically show, via flow chart, the processes and their relationships to each other, the inspection and test controls, and a narrative for each process.

Quality Program Procedures

All written procedures shall clearly describe the purpose of the process, overview of the process, responsibilities, steps of the process, and records resulting from the process.

Withholding of Payment and Work Suspension

If there is evidence that the Design-Builder's quality procedures are not adequate (as evidenced by the Department's oversight reviews or problems during design or construction), the Department may, at its sole discretion, withhold payment for design and construction until sufficient quality procedures are in place. If construction is in progress, the Department may suspend ongoing work represented by the deficient quality procedures and require correction of design and/or construction defects.

Subject to the Department's determination, the Department may assess the Design-Builder a \$100-per-hour monetary deduction for failure to facilitate satisfactory progress or completion of the Work. Hourly charges may be applied to periods during which the Department determines the

Design-Builder has not satisfactorily responded to a documented non-compliance. No charge will be assessed if the deficiency is corrected by the Design-Builder within one hour of written notification from the Department.

2.4.2.3.2 Quality Manual – Template

To aid the Design-Builder with development of the Quality Manual for the Project, the Department has developed a Quality Manual Template (Exhibit 2-A) consisting of four volumes:

- Volume I – Quality Management Plan (includes the overall Quality Management Plan, Design Quality Management Plan, and the Construction Quality Management Plan)
- Volume II – Construction Quality Inspection and Testing Plan
- Volume III – Materials Control Schedule
- Volume IV – Document Management Plan

These manuals contain the quality processes and procedures the Department expects to see in the Design-Builder's final Quality Manual for the Project. The template shall be considered minimum and the Design-Builder shall enhance these manuals as necessary to provide an overall comprehensive Quality Management Plan for the Project. The Design-Builder may submit its own Quality Management Plan, but it shall cover all the topics contained in Volumes I-IV of the Department's Quality Manual Template and meet all requirements of the Contract. This Quality Manual will be subject to the Approval process detailed in this Section 2.4.3.1.

Other areas the Design-Builder should pay close attention to in their final Quality Manual are:

- Unique and/or innovative design items
- Unique and/or innovative construction items
- Warranty Requirements that could lead the Design-Builder to modify their quality processes or procedures

2.4.2.3.3 Quality Manual – Responsibility

The Quality Manual shall:

- Graphically depict the lines of responsibility and interfaces to describe the Design-Builder's organization;
- Require that all Design-Builder personnel be responsible for reporting quality problems;
- Describe all verification resources, such as design verifiers, checkers, inspectors, and testers that the Design-Builder will utilize;
- Depict how the Design-Builder's design technical experts are incorporated into the construction phase of the Project

Quality Manual Personnel/Staff

The Design-Builder's Quality Manager shall:

- Be Approved by the Department.
- Have overall responsibility for the success of the Quality Program
- Have no responsibilities in the production of the Work.
- Verify and provide confidence that the Work meets or will meet the contractual requirements.
- Be the point of contact to resolve non-conformances and project quality issues with the Department.

- Report to the Department Contract Manager and the Design-Builder's executive management committee and be independent of the Design-Builder's Project Manager.
- Have the authority to stop work.

The Design-Builder shall also identify all other staff with the authority to stop Work, and ensure they understand the processes to implement this.

The Design-Builder's quality staff shall not have the ability to deviate from Project requirements or to interpret Project specifications. Their role is solely to ensure the finished Work meets the requirements of the Contract.

Resource Qualifications

Personnel assigned to perform testing or inspection shall possess the necessary Department Technical Certifications for the Work they are testing or inspecting. Critical Activity Point Managers shall be registered Professional Engineers in the State of California or shall have the applicable Department Technical Certifications for the Work performed under the Critical Activity Point.

Management Accountability

The Quality Manual shall describe the Quality Manager's accountability for ensuring the effective implementation and maintenance of the Quality Manual.

Management Review

The Design-Builder's executive management committee shall review the Quality Manual at least quarterly, and more frequently if necessary, to ensure its continuing suitability and effectiveness in satisfying the requirements of this Contract and the Design-Builder's stated quality policy and objectives.

The Design-Builder shall invite the Department to participate in the management reviews.

The management reviews shall, at a minimum, reviews the results of internal audits, Department audit results, corrective actions taken, trends in nonconformance, and time to resolution.

The outputs of management reviews shall be incorporated into the Quality Manual.

Quality Manual – Construction

Quality Planning

The Quality Manual shall include an Inspection and Testing Plan describing all of the proposed inspections and tests to be performed throughout the construction process. The Department has provided a Construction Quality Inspection and Testing Plan in the Quality Manual Template, Vol. II. The Design-Builder shall tailor the Inspection and Testing Plan to meet the Project requirements.

Inspection and Testing Plan

The Inspection and Testing Plan shall

- Describe all of the incoming, in-process, and final inspections and tests to be undertaken.
- Show what products or services are to be subcontracted.
- Be controlled through the provision of document control and be updated when new Subcontractor or Supplier contracts are implemented.
- Identify critical activity points at which Work shall be formally accepted by independent quality personnel and the Department prior to proceeding to the next stage of the Work. The Design-Builder shall provide Critical Activity Point Managers to ensure that all required tests

and inspections have been performed leading up to critical activity points, and that the test and inspection results meet Contract requirements. The Design-Builder is encouraged to enhance this portion of the Construction Quality Inspection & Testing Plan from the Quality Manual Template.

- Describe verification of Suppliers' and Subcontractors' compliance with requirements.
- Depict the Quality Inspection (QI) critical activity points from the Materials Control Schedule and shall contain a written sign-off form for this activity.
- Be approved by the Quality Manager.

The Design-Builder shall define the following within the inspection and testing procedures:

- The activity to be tested or inspected
- The agency or laboratory to perform the test or inspection
- The frequency of the test or inspection
- The test or inspection procedure or reference standard
- The specified requirement reference
- The record that documents the results

All material tests shall reference the activity ID.

The Quality Manual shall identify Work for which statistical techniques will be used as a basis of quality and acceptance or rejection of lots.

Materials Control Schedule

The Department has provided the Materials Control Schedule (MCS) for the Project which outlines the minimum sampling, testing, and inspection required for most materials used in highway construction. The MCS is included as Vol. III of the Quality Manual Template.

The Design-Builder shall review the MCS for areas where inspection or testing is not addressed or the Design-Builder desires an increased rate of inspection or testing. The MCS has been reviewed and approved by the Federal Highway Administration (FHWA), so any recommended changes by the Design-Builder will require Approval from the Department and possibly FHWA.

Both the Design-Builder and Department shall designate a Materials Control Schedule Coordinator for the Project. The Design-Builder's designee will be directly responsible for all MCS issues that arise on the Project, including:

- Ensuring all requirements of the MCS is met.
- Evaluating and resolving of all test result and test tolerance issues.
- Ensuring proper sampling processes and procedures are utilized by all quality staff.
- Ensuring all Quality Inspection (QI) critical activity points are addressed as defined in the MCS.
- Reviewing and tracking all quality training requirements.
- Scheduling Independent Assurance reviews for the Project.
- Ensuring the Materials Certification for the Project is completed and all issues properly addressed.
- Ensuring proper completion of all sample cards and all necessary tests are completed on the sampled materials.
- Coordinating the MCS requirements with all Suppliers and Subcontractors.

The Department will be taking all samples for acceptance testing and independent assurance sampling testing. The material sample shall be submitted to the Materials Control Schedule Coordinator for delivery and testing.

The Design-Builder shall provide all applicable testing and inspection data, in a timely manner. This will ensure the MCS requirements are being adhered to and, if shortcomings are found, improvements to the Inspection & Testing plan shall be made. The Design-Builder shall input and provide all testing and inspection records, including records from suppliers and subcontractors, electronically to the DCS.

Quantities and Production Tracking

The Department will track general quantities of materials, labor, and equipment and enter the data into DCS.

The Design-Builder shall share quantities, as requested, for verification of testing rates (in accordance with the Materials Control Schedule) with both their quality staff and Department's staff on the Project.

2.4.2.3.5 Quality Manual - Design

General

All design (including design by Subcontractors) must meet the requirements of the Design-Builder's Quality Manual and the Contract Documents.

Design and Development Planning

The Quality Manual shall describe the design and verification activities separately.

The Quality Manual shall describe how the design team schedules the design efforts, including design reviews, verification and checking stages, and issue dates of design deliverables.

The Quality Manual shall include details as to the level of involvement of the Department in the design development process. The Design-Builder is encouraged to involve the Department in all design development processes, including Independent Technical Reviews, and Constructability Reviews.

The Quality Manual shall describe how the security of documents shall be controlled during the Project.

Organizational and Technical Interfaces

The Quality Manual shall describe the coordination of the design with construction.

Design Input

The Quality Manual shall describe how all design criteria, Contract requirements, and other design inputs are defined, reviewed, and approved.

The Design-Builder shall maintain an accessible, centrally controlled manual, database, or list that contains all relevant design inputs or references to design inputs to be used by design personnel to incorporate into the design.

The Design-Builder shall ensure that the design inputs are communicated to, and accessible by, the relevant designers responsible for incorporating design inputs into the design outputs.

Design Output

Submission of design documents to agencies other than the Department shall be determined by the Design-Builder and included in the Quality Manual. All Work associated with review and comment of the design by outside agencies shall be the responsibility of the Design-Builder. The

Design-Builder shall share copies of all correspondence with outside agencies and any design review comments by them with the Department.

The Quality Manual shall define the design outputs (i.e., the specific plans and specifications) to be produced.

Released for Construction Documents

Released for Construction Documents shall constitute the documents issued for the purposes of construction.

The Design-Builder shall ensure

- That no construction Work is undertaken without Released for Construction Documents.
- That the timing of submission of Released for Construction Documents is indicated in the Project schedules.
- That all Work, including modifications to the Work, is designed under the authority of and signed by a California-licensed Professional Engineer.

All Released for Construction Documents shall meet the following requirements:

- The Design-Builder shall prepare plans that are similar in appearance and content as shown in the Plans Preparation Manual (PPM). Variations may result due to design-build delivery. The Design-Builder shall meet with the Department to obtain Approval of any variations in plan content and format.
- The Design-Builder shall prepare all drawings in accordance with Department CADD standards.
- The Design-Builder shall ensure that all drawing files are prepared in Micro Station V8 version.
- The Design-Builder shall ensure that CAiCE is used for design, unless otherwise specified by the Department.
- The Design-Builder shall ensure that all deliverables containing CADD data shall be in MicroStation, see Section 4.1 of CADD Users Manual, or CAiCE format for design deliverables, see Sections 3.6 and 3.7 of the CADD Users Manual. This shall include CADD data received from other agencies.
- The Design-Builder shall ensure that all Microstation drawings, CAiCE design files, and associated documents are organized in a logical manner, have a uniform and consistent appearance, and clearly depict the intention of the design and construction.
- The Design-Builder shall follow general plotting requirements as stated in Section 4.1 of the CADD Users Manual.
- The Design-Builder shall ensure that all designs and drawings are in U.S. Survey Foot.
- The Design-Builder shall include the limits of excavation for all excavation work.
- The Design-Builder shall include quantities in all Released for Construction Documents for all items which require inspection or testing in accordance with the MCS.
- The Design-Builder shall ensure that all special provisions, shop drawings, and other items necessary to construct the Work are submitted as Released for Construction Documents.

Shop and Working Drawing Documents

The Design-Builder's Engineer of Record shall review, approve, authorize, and confirm any methods or procedures that are contained in the Department *Standard Specifications*, then submit the signed design drawings to the Design-Builder's construction team. The construction team

shall then generate shop and working drawings as necessary to clearly define, control, construct, and inspect the Project. These working drawings shall be sent back to the design team for review and internal approval. All such drawings shall be reviewed and approved by the Engineer of Record, and shall be stamped “Approved for Construction” as per the Department *Standard Specifications*, prior to being issued for construction.

The Design-Builder shall consult with the Department and all other applicable governmental entities that may require review of shop and working drawings and shall coordinate the preparation, submittal, and review of all such shop and working drawings. Where governmental approvals or approvals from Utility Owners are required, shop and working drawings shall be submitted to the applicable party for review and approval in accordance with their requirements.

Shop and working drawings for the Project shall include structural steel fabrication plans, anchor bolt layouts, shop details, erection plans, equipment lists, and any other information specifically required by the Construction Quality Manager, *Department Standard Specifications* or other governmental entities.

Shop and working drawings and calculations for excavation shoring, cribs, cofferdams, falsework, MSE walls, overhead signs, temporary support systems, formwork, and other temporary Project elements that describe the methods of construction proposed to be used for the Project shall be prepared by the Design-Builder in accordance with their Quality Manual. Receipt of submittals for temporary Project elements by the Department shall in no way constitute approval of the planned Project element or impose any liability upon the Department.

Approved shop or working drawings shall be provided to the Department at least five Working Days prior to the start of any construction detailed by those drawings. The Design-Builder shall make no changes in any approved shop or working drawing after the design engineer has approved them. Any deviations from approved shop or working drawings shall require the fabricator to submit revised drawings to Design-Builder’s design engineers for their approval, as outlined above.

As-Built Documents

The Design-Builder shall deliver to the Department As-Built Plans that depict the final completed Project, including all changes from Released for Construction submittals, and data showing all items such as the electrical systems, drainage systems, lighting systems, underground and overhead Utilities, traffic controls and striping, signing placement, highway alignment and grade revisions, typical sections, and all other relevant data, including any operations and maintenance manuals for mechanical and electrical systems.

The Design-Builder shall ensure that the As-Built Documents meet the requirements of the Released for Construction Documents and the following additional requirements (see Section 4.3 of the CADD Users Manual, the Plans Preparation Manual, and the Construction Manual):

- As-Built Documents shall include all base mapping (topography), design plans (including shop drawings), design calculations, design reports, specifications, and electronic CADD data.
- The Design-Builder shall ensure that all title blocks of calculation sheets include the calculation title, file number, page number, initials of the designer and the checker, and dates of design and checking.
- The Design-Builder shall ensure that all calculations indicate the design requirement, the assumptions made, the methods used, the source of the information, and the cross-reference for the applicable design drawings.

- The Design-Builder shall ensure that all structure calculations performed using software are independently checked by a California-licensed Professional Engineer with 10 years minimum experience. The Design-Builder shall ensure that all calculations are verified.
- The Design-Builder shall ensure that all calculations are readily accessible, clear, understandable, concise, complete, and accurate.
- The Design-Builder shall ensure that all calculations are bound and numbered with a table of contents.
- The Design-Builder shall ensure that all calculations identify the code or standard utilized and indicate the specific section referenced in the right hand column.
- In the calculations, the Design-Builder shall reference the computer programs used.
- The Design-Builder shall ensure that all manual calculations are printed, neatly and legibly, on 8½-inch by 11-inch or 11-inch by 17-inch standard computation sheets.

The Design-Builder shall ensure that the As-Built Documents reflect the actual condition of the constructed Work. The Design-Builder's Project Manager shall sign and date the title sheet of the As-Built Plans to certify that the Project was completed in accordance with the plans, the Contract Documents, the governmental approvals, and applicable law.

The Design-Builder shall collect, properly identify, and deliver to the Department all original diaries, logs, notebooks, accounts, records, reports, and other documents prepared in the performance of the Contract upon completion or termination of the Contract.

The Design-Builder shall ensure that the Project History File meets the requirements of Chapter 7 of the Project Development Manual.

Design Review

Department Review Procedures

The Department will review as many design packages as it can within the limitations of its staff; however, at the Department's sole discretion, it may limit the number design submittals, and design re-submittals in a given week.

After each formal review, the Design-Builder shall address all comments and concerns raised by the Department by revising the design plans and/or specifications to the Department's satisfaction.

Over-the-Shoulder Reviews

Over-the-shoulder reviews are informal examinations by the Department of design documents during the Project design process. Over-the-shoulder reviews will mainly assess whether the requirements and design criteria of the Contract documents are being followed and whether the Design-Builder's design quality management plan activities are being undertaken in accordance with the approved Quality Manual.

Each design package may have multiple over-the-shoulder reviews at the request of either the Department or the Design-Builder. The reviews may, at the Department's discretion, include review of design drawings, electronic files, calculations, reports, specifications, geotechnical data, progress prints, computer images, draft documents, draft specifications and reports, other design documents, and any other relevant design information as requested by the Department.

It is the intent of these reviews to check for concept, level of detail, design criteria, and fatal flaws. Comments made by the oversight team will be considered non-binding. It is the Design-Builder's responsibility to conform to the Contract requirements. These reviews will not routinely include detailed calculation or drawing reviews, although the Department retains the right to

perform detailed reviews of any item at any time. If mutually agreed upon between the parties, for specific review items, the over-the-shoulder review may consist of an exchange of electronic files between the Design-Builder's designer and the Department.

The Design-Builder shall schedule over-the-shoulder reviews with the Department during the course of the development of each design package, prior to issuance of Released for Construction Documents. The over-the-shoulder reviews are not critical activity points that restrict the progress of design. They are simply reviews of the design as it progresses and opportunities for the Department to provide comments and feedback on the design. The Quality Manual shall define the frequency, timing, content, and format of the over-the-shoulder reviews.

Prior to every over-the-shoulder review, the Design-Builder shall provide the Department with hardcopies of the latest design of the element to be reviewed.

In-Progress Design Workshops

Throughout the design process, the Design-Builder or the Department may request (with at least five Working Days notice) in-progress design workshops to discuss and verify design progress and to assist the Design-Builder and/or its designer(s) in resolving design questions and issues.

At least five Working Days prior to each in-progress workshop, the Design-Builder shall assemble and submit drawings or other documents to be reviewed during the workshop to the Department for its information and review.

The Design-Builder shall maintain a written record of all in-progress design workshops, including:

- A list of the participants in attendance
- Description of the items covered and discussed
- Identification of discrepancies and comments, and a report on corrective actions (both those taken and those planned)
- Identification of follow-up action items, due dates, the party responsible for action items requiring resolution, and deadlines for resolution

Oversight Visits

Throughout the design process, the Department may make oversight visits to discuss and verify design progress and ascertain the overall progress of the Project with respect to the Design-Builder's Quality Manual. If, at the sole option of the Department, the Design-Builder is not meeting the goals and objectives of the Quality Manual, the Design-Builder shall suspend all Project work and the Department may withhold payment for the associated design activities.

Department Review Time Requirements

The Department will complete its review of the Design-Builder's plans and submittals based on the following review time requirements unless otherwise noted in subsequent sections of these technical provisions:

QMP	30 Calendar Days
Design Plans	15 Calendar Days
Structure Plans	15 Calendar Days
Shop Plans	15 Calendar Days
Released for Construction Submittal:	10 Working Days

Other Reports/Plans	***
Design Exceptions	30 Calendar Days
RFI Submittal:	3 Working Days

*** Review times for Other Reports/Plans are established in the Technical Provisions as 15 to 30 Calendar Days

These review timelines depict the maximum allowed time the Department has to review the associated submittals and respond to the Design-Builder without impacting the overall Project schedule. Each design package above may go through multiple iterations of review by the Department before Approval. The Department, review timelines above starts over for each package re-submittal. The actual Department review timeline may be directly related to the extent of involvement the Design-Builder allows during the design development process. More up-front Department involvement may shorten the review timelines. The Department, however, makes no guarantees of a streamlined review process for any design submittal. Submittal review times may be reduced or extended as mutually agreed upon for simple or complex submittals. The Department does not control and therefore cannot guarantee the review times by third parties.

Design submittals

Released for Construction Submittals

The Design-Builder shall submit the Released for Construction (RFC) Documents to the Design Quality Manager for review and approval prior to submitting the RFC Documents for the Department Approval. The Design-Builder shall incorporate comments from the over-the-shoulder reviews and/or re-submittals into its design and resolve all concerns and questions to the satisfaction of the Department. RFC Documents are intended to allow construction to begin on segments or elements of the Project as the design progresses and before final design is complete.

The Design-Builder may proceed with construction of elements or portions of the Project in accordance with Released for Construction Documents before the design of the entire Project has been completed at their sole risk.

The Design-Builder acknowledges and agrees that it may not start construction on any Released for Construction Documents until the Department and applicable government entities, Utilities and Railroads Approve the Plans. Construction of any item, element, or phase covered by the Design Quality Manager's statement approving construction shall progress only to the extent covered by the design documents included in that Approval. Before progressing further with construction, the Design-Builder shall complete the next phase of design or complete the final design, and obtain the Department's concurrence. Any subsequent phases of design to be released for construction shall be checked and Approved by the Design Quality Manager in the same manner as indicated above for the initial item or element.

The Department's concurrence/acceptance will not constitute approval of the design or subsequent construction, nor relieve the Design-Builder of its responsibility to meet the Contract requirements. Irrespective of whether the Department provides the Design-Builder with the authority to begin construction on elements of the Project prior to completion of the entire design, the Design-Builder shall bear the responsibility to ensure that construction meets the requirements of the Contract Documents, applicable law, and the governmental approvals.

Re-submittal Process

Re-submittals of any design submittal may be required if deemed necessary by the Design Quality Manager or the Department. Each re-submittal must address all comments received from

a prior submittal in a manner satisfactory to the commenting party. The Design-Builder shall not be entitled to any additional compensation or time extension due to any re-submittal requirement by the Design Quality Manager's review process or the Department.

The Design-Builder acknowledges and agrees that re-submittal of any submittal may be required. The Design-Builder shall resubmit the submittal as many times as necessary to address the comments of the Design Quality Manager's review process and the Department.

The Design-Builder may continue its design activities, at its sole risk, during the re-submittal process. Such continuation in no way relieves the Design-Builder of the responsibility to incorporate the comments of the re-submittal process and the Department into the design documents.

Upon completion of the Design Quality Manager's review, the Design-Builder may forward such re-submittals to the Department for review and comment. If the Department requests additional information during review of the re-submittal, the Design Quality Manager shall conduct an additional review of the resubmitted items.

Concurrent Submittals

During Project Startup, a list and schedule of deliverables will be established and provided to the Department. This list will also be provided to FHWA and other third party reviewers.

It will be expected that more than one review package will be submitted for review at the same time requiring some of the reviews to be completed concurrently. However, the maximum number of submittals to Department allowed per week and per type are as follows:

Design Plans	2
Structure Plans	2
Other Reports/Plans	2
Project History File	1

Design Changes

The Quality Manual shall describe how changes to design are identified, reviewed, and approved by authorized personnel prior to their implementation.

The Quality Manual shall describe the method of communicating changes or revisions made in the field.

Either the Design-Builder or the Department may initiate design changes for items or elements undergoing construction.

2.4.2.3.6 Quality Manual – Document and Data Control

General

The Design-Builder's Quality Manual shall include a Document Management Plan. The Department has provided a Document Management Plan, Vol. IV of the Quality Manual Template, for the Design-Builder to enhance and include in the Design-Builder's Quality Manual.

The Design-Builder's Document Management Plan shall:

- Describe the Design-Builder's document control system (DCS) to store and record all documents, correspondence, design inputs, drawings, progress reports, technical reports, specifications, Contract Documents, submittals, calculations, test results, inspection reports,

nonconformance reports, administrative documents, and other documents generated under the Contract. This includes all hardcopy and electronic records.

- Identify how records are to be maintained and kept throughout the duration of the Project,
- Describe the methods by which all documents issued and received by the Design-Builder will be logged, tracked, and retrieved.
- Identify how all documents will be tracked using a unique document control number.

Document Submittals to Department

The Design-Builder shall furnish hardcopies of all Project deliverables to the Department. All management plans, such as the Quality Manual, Public Information Plan, Environmental Management Plan, Utility Plan, and Traffic Management Plan shall be individually bound. Each document that is transmitted to the Department shall be controlled by a unique document control number.

Electronic copies of all documents generated under the Contract, including all Project deliverables, shall be uploaded to DCS in native format and software-generated PDF format. An example would include creating PDF files from MicroStation drawings (DGN) for Released for Construction plan sheets. Scanned PDF files will not be accepted unless the original document is in handwritten form or if the original is not electronic.

All electronic data for Plan submittals; including MicroStation, CAiCE, and all other design software-specific electronic files to be submitted shall be uploaded to DCS in native format.

Document and Data Approval and Issue

The Design-Builder shall ensure that all deliverables include a signed and dated certification by the originator of the deliverable assuring that the deliverable is complete and meets the Contract requirements.

Document and Data Changes

The Design-Builder shall ensure that any changes to documents provided to the Department are in a format that can enable changes to be readily apparent and tractable (e.g., documents using the redline /strikeout method).

2.4.2.4 Department Role

2.4.2.4.1 General

The Department will perform systematic audits, reviews, and testing and inspection in its role. There are three primary roles:

- Design auditing will be performed on the products of design (drawings, calculations, specifications, special provisions, studies, reports and other design outputs). Design auditing is performed on an ongoing basis during the design phase of the Project.
- Department will perform construction acceptance testing and independent assurance sampling and testing. The Department will provide formal acceptance of Work at critical activity points. The Department will also perform Source Inspection.
- Management Program auditing will be performed on the implementation of the Design-Builder's management plans and Quality Manual. These audits will be systematic and independent examinations to determine whether quality activities and related results comply with planned quality activities and expected results and whether they are implemented effectively and are suitable to achieve objectives.

- Each organization (i.e., Design-Builder, Subcontractor, Supplier, etc.) will be subject to periodic management system audits.

Auditing will entail the collection and documentation of objective evidence to verify whether requirements have been met. The results of auditing will be documented on standardized audit report forms with copies provided to the Design-Builder. Non-conformances will be communicated and tracked in separate reports. The audit results will also be recorded in a database, and regular summary and status reports will be provided to the Design-Builder. The timing, frequency, and depth of auditing will be at the Department's discretion.

At any time as deemed necessary at the sole discretion of the Department, the Department oversight staff may perform inspections or take samples for further investigation of possible non-conforming Work.

2.4.2.4.2 Access and Testing

Representatives of agencies of the federal government and representatives of other agencies of California shall have the right to inspect the Work to the same extent provided above for the Department and as required by Governmental Rules.

The Design-Builder shall provide safe access to the Work, its organization, and all Subcontractor and Supplier organizations to allow the Department to carry out oversight activities. This will include the taking of samples for the purposes of testing, the examination of records, and interviews with personnel from the Design-Builder's organization and all Subcontractor and Supplier organizations.

The Design-Builder shall not use the results of oversight activities carried out by parties other than itself to be used as a substitute for its own quality activities, unless otherwise approved in writing by the Department.

The Design-Builder shall provide the Department with copies of requested records within two Days of receipt of request.

When requested, the Design-Builder shall advise the Department of the time, to within four hours accuracy, when a specific activity is scheduled within the next five Days.

The Design-Builder shall, within five Days of the identification of a construction-related non-conformance(s) by the Department, propose a resolution for the Department's Acceptance or Approval.

Following Acceptance or Approval of the proposed resolution by the Department, the Design-Builder shall notify the Department 24 hours prior to implementing the proposed solution so that the Department may witness the implementation, should the Department so choose.

2.4.2.5 Review and Disposition of Nonconforming Product

The Design-Builder shall ensure that non-conformances identified during the design verification and checking, testing, and inspection activities are recorded. The Design-Builder is responsible for the resolution of all non-conformances, including those of subcontractor or suppliers.

The Quality Manual shall describe how the Design-Builder plans to deal with discovered non-conformances, tracking non-conformances, resolving non-conformances, and preventing similar non-conformances from occurring on future work within the Project.

2.4.2.6 Corrective and Preventative Action

2.4.2.6.1 General

The Design-Builder shall review the cause of major and systemic non-conformances and develop corrective action to prevent recurrence.

The Quality Manual shall describe the corrective and preventive actions the Design-Builder will take upon the identification of actual or potential major and systemic non-conformances, identified internally or by the Department.

The Design-Builder's proposed corrective action shall be documented in a format and medium acceptable to the Department.

The Design-Builder shall advise the Department when the corrective action has been implemented so the Department may verify the implementation, should the Department so choose.

2.4.2.6.2 Corrective and Preventive Action

The Design-Builder shall, within five Days of the identification of a major or systemic problem by either Design-Builder or the Department staff, propose to the Department, for their Approval, a corrective or preventive action to prevent the recurrence of the problem. The Design-Builder shall update the Quality Management System to incorporate the Approved corrective action.

2.4.2.7 Internal Quality Audits

The Design-Builder shall ensure that internal quality audits, for each element of the Quality Management System, are performed at least every six months.

2.4.2.8 Software

The Design-Builder shall use the DCS for logging and tracking their construction inspection and testing data and for design comments logging, tracking, and resolution for this Project. The Design-Builder shall provide DCS access to the Department.

2.4.3 Deliverables

2.4.3.1 Final Quality Manual

2.4.3.1.1 Submittal and Approval

The Design-Builder shall submit six individually bound hardcopies and one electronic version on CD-ROM of the Quality Manual (Vol. I – IV) for the Department approval within 30 Days of NTP1. The Department will respond to the Design-Builder within 15 Working Days of receipt of the draft Quality Manual, and will either Approve or return comments on the submitted manual. If the draft Quality Manual is not approved, the Department's comments shall be incorporated by the Design-Builder. Within 10 Days after the Department has returned the comments, a new draft Quality Manual shall be resubmitted. It is the Design-Builder's responsibility to meet with the Department as often as necessary to discuss and resolve the Department's comments within said 10 Days.

If the Design-Builder begins design before Approval of the Quality Manual, they shall do so only at their sole risk. The Department reserves the right to withhold payment for design and construction Work until the Quality Manual has been Approved. Once the Quality Manual is Approved, the Design-Builder shall not revise any portion without the prior written Approval of the Department.

Following Approval, the Design-Builder shall provide the Department with 10 hardcopies of the Quality Manual and upload an electronic version in native and PDF format into DCS.

2.4.3.1.2 Track Changes

The Design-Builder shall track all changes made to the Department's Quality Manual Templates and clearly depict them to the Department in their submittals. Versions with tracked changes shall be submitted with all native electronic files.

2.4.3.1.3 Ownership

The Design-Builder shall acknowledge in each submittal that they understand the Department has full and complete ownership of the products submitted and may use all products on this and other projects without any compensation or consideration to the Design-Builder.

2.4.3.2 Released For Construction Documents

The Design-Builder shall submit to the Department for Approval two hardcopies of all Released for Construction Documents. The Design-Builder shall create electronic PDF versions of all hardcopies and upload them into DCS. RFC packages shall include the following (at a minimum):

- Cover Sheet with submittal description and schedule activity identification
- Design Quality Manager Certification in accordance with the Quality Manual
- Design plans
- Design calculations
- Design reports
- Specifications and Special Provisions
- Governmental, Utility Owner, and Railroad approvals

Other electronic files included in Released for Construction submittals shall include the following:

- MicroStation and/or CAiCE files, including all drawings and data files used to create the RFC Documents.
- Project History File documents identified in Chapter, Uniform File System of the Project Development Manual.
- Excel spreadsheet with drawing index (for DCS compatibility). This spreadsheet shall include the discipline, drawing number, drawing title, sheet number (sequentially), and sheet title.

2.4.3.3 Shop and Working Drawing Documents

The Design-Builder shall submit to the Department two complete hardcopies of all shop and working drawings and upload electronic versions in native and PDF format into DCS.

2.4.3.4 As-Built Documents

The Design-Builder shall submit to the Department for Approval two complete hardcopies of all As-Built Plans and two sets of electronic files, TIFF and DGN, on CD-ROM of all As-Built Documents available in a digital format (See Section 4.3 of the CADD Users Manual). The Department will advise the Design-Builder of the status of their Acceptance of the As-Built Documents within 30 Working Days of receipt of same. Formal written Approval of the As-Built Documents must be granted by the Department before finalization of the Contract. Upon Approval, the Design-Builder shall upload electronic versions of all As-Built Documents, in DGN and TIFF format.

2.4.3.5 Product Data

The Design-Builder shall submit to the Department for Acceptance two hardcopies of all manufacturers' warranties, guarantees, instruction sheets, parts lists, and other product data within 20 Days of installation of the items to which they relate, and in any event prior to Final Acceptance. The Department will advise the Design-Builder of the status of this product data within 10 Working Days of receipt of same.

Electronic versions in native and PDF format shall be uploaded to DCS.

The Design-Builder shall ensure that the product data cited in this section are organized and indexed in a manner to allow easy retrieval of information.

2.5 Human Resource Management

2.5.1 General

The Design-Builder shall conduct all Work necessary to meet the requirements of human resource management, including personnel, facilities, and equipment.

2.5.2 Administrative Requirements

2.5.2.1 General

All personnel performing Work on the Project shall have the experience, skill, and knowledge to perform the Work assigned to them. All personnel performing Work on the Project shall also have appropriate required professional licenses and certifications.

2.5.2.2 Key Personnel

2.5.2.2.1 General

Level A and Level B Key Personnel for the Project shall include the following:

Level A Personnel

- Project Manager
- Quality Manager
- Design Manager
-
- Construction Manager
- Design Lead Engineer - Roadway
- Geotechnical Engineer

Level B Personnel

- Design Quality Assurance Manager
- Construction Quality Assurance Manager
- Traffic Engineer
- Safety Manager
- Utilities Design Engineering and Coordination Manager
- Environmental Compliance Manager
- Traffic Control Supervisor

-
- Survey Manager
 - Hydraulics Engineer
 - Public Information Coordinator
 - Storm Water Pollution Prevention Manager
 - Project Controls Manager
 - Hazardous Materials Manager
 - Electrical Engineer
 - Visual Quality Manager

2.5.2.2.2 Minimum Requirements of Key Personnel

The following provides a brief job description and minimum requirements of the Level A Key Personnel and some of the Level B Key Personnel assigned to the Project. Key Personnel will be evaluated, in part, based on the extent they meet and/or exceed such requirements. All Key Personnel will be required to be available to the Project Site during activities that involve their areas of responsibility.

Design-Builder's Project Manager

- Shall be responsible for the overall design, construction, quality control, and Contract administration for the Project. This person shall have full responsibility for the prosecution of the Work, and will: i) act as agent and be a single point of contact in all matters on behalf of the Design-Builder; ii) be present (or his/her Approved designee will be present) at the Site at all times that Work is performed; iii) and have full decision-making and budgetary authority to act on behalf of the Design-Builder and bind the Design-Builder on all matters relating to the Project.
- Shall be a licensed Professional Engineer in the State of California now or by the time the first Notice to Proceed is issued

Quality Manager

- Shall report directly to the Design-Builder's executive management committee
- Shall be a licensed Professional Engineer in the State of California now or by the time the first Notice to Proceed is issued.
- Shall have overall responsibility for overseeing the Quality Management of design, construction, and project management activities, including authority and responsibility for all Quality Management resources.
- The Design Quality Assurance Manager and Construction Quality Assurance Manager shall be different people.
- Shall not be assigned any other duties or responsibilities on the Project.

Design Manager

- Shall be responsible for ensuring that the overall Project design is completed and design criteria requirements are met. The Design Manager must be available to the Department within 24 hours whenever design activities are being performed, including design activities related to field design changes.
- Shall work under the direct supervision of the Design-Builder's Project Manager.
- Shall be a licensed Professional Engineer in the State of California now or by the time the first Notice to Proceed is issued.

Construction Manager

- Shall Report directly to the Project manager
- Shall be responsible for ensuring that the project is constructed in accordance with the design and project requirements
- Must be present at the site of work at all times construction is in progress
- Has authority to stop work
- Shall have recent experience managing the construction of highway projects similar in scope and complexity
- License as Professional Engineer in California is preferred but not required

Design Lead Engineer - Roadway (Engineer of Record)

- Reports directly to DB Design Manager
- Engineer of Record for the roadway design
- Responsible for ensuring that the roadway design is completed and design criteria are met
- Must be present at all review and design coordination meetings
- Recent experience in the design of highway projects similar in scope and complexity
- Must have a license as Professional Engineer in California

DB Geotechnical Engineer

- Shall report directly to DB Design Manager
- Shall be responsible for geotechnical investigations and reports
- Must have recent experience in deep foundation design including large pipe piles, drilled shafts, monitoring drilled shaft construction, drilled shaft load testing criteria and analysis, spread footings, and settlement
- Must have a license as Professional Engineer in California

Design Quality Assurance Manager

- Shall report directly to the Design-Builder's Quality Manager.
- Shall be responsible for implementing design related quality planning and training, as well as providing continuous improvement of the quality management system.
- Shall have responsibility for design quality management including overseeing the day-to-day quality aspects of design.
- Shall be a licensed Professional Engineer in the State of California now or by the time the first Notice to Proceed is issued.
- The Design Quality Assurance Manager and Construction Quality Assurance Manager shall be different people.
- Shall not be assigned any other duties or responsibilities on the Project.

Construction Quality Assurance Manager

- Shall report directly to the Design-Builder's Quality Manager
- Shall be responsible for overseeing the day-to-day quality aspect of construction and Project management activities including managing the Design-Builder's workmanship inspections,

overseeing Design-Builder's production testing, and coordinating with the Department's verification testing and inspection.

- The Design Quality Assurance Manager and Construction Quality Manager shall be different people.
- Shall report directly to the Design-Builder's executive management committee.
- Shall be assigned full-time to the Project and be on Site during regular business hours whenever any Work is being performed and be available to be on Site within two hours outside of regular business hours.
- Shall not have any production-related responsibilities.
- Shall have the authority to stop any and all Work that does not meet the Contract requirements.
- Must be a registered Professional Engineer in the State of California now or by the time the first Notice to Proceed is issued.

Traffic Engineering Manager

- Shall report to the Design Manager.
- Shall be a licensed Professional Engineer in the State of California now or by the time the first Notice to Proceed is issued.
- Shall be experienced in signal design, lighting design, signing design and stripping, work zone safety, and work zone traffic control plan design.

Hydraulics Engineer

- Shall report directly to the Design Manager.
- Shall attend regularly scheduled review, progress, coordination, and other meetings at the co-located facility.
- Shall be available to the Project within 24 hours during construction activities.
- Shall be a licensed Professional Engineer in the State of California now or by the time the first Notice to Proceed is issued.

Safety Manager

- Must not be under the direct supervision of construction personnel and will report directly to Design-Builder's Project Manager.
- Shall be available to the Site for the duration of the Project.
- Shall have the authority to stop any and all Work when unsafe conditions are present.
- Must be familiar with work zone safety regulations and must have at least five years of recent experience working in roadway work zone safety and OSHA (Cal-OSHA) regulations.

2.5.2.2.3 Approval of Key Personnel

The Department will have the right to Approve or reject the Design-Builder's Key Personnel prior to their participation on the Project. Such Approval will be based on the qualification requirements set forth above and elsewhere in the Contract Documents for all Key Personnel.

2.5.2.2.4 [NOT USED]

2.5.2.2.5 Replacement of Key Personnel

The Design-Builder shall notify the Department in writing of any proposed changes to Approved Key Personnel and shall include a detailed resume summarizing the items set forth above and

elsewhere in the Contract Documents. No Key Personnel shall be replaced without the prior written Approval of the Department. The changes will only be approved if the replacement Key Personnel are equally qualified or more qualified than the original Key Personnel.

2.5.2.2.6 Directory of Key Personnel

The Design-Builder shall prepare a directory of Approved Key Personnel that includes the following information for each individual: name, Project title, Project office address, Project office location, e-mail address, telephone numbers (office, mobile, pager), and fax number. The directory shall be kept current throughout the course of the Project.

2.5.2.3 Co-location

2.5.2.3.1 General Provisions

For this Project, co-located facilities will not be required. The Design-Builder shall provide or arrange for the use of meeting space for regularly scheduled Project meetings. The Design-Builder shall provide office space and high speed internet connections for the use of up to five Department personnel in the office of its design consultant during the design phase of the Project.

2.5.2.3.2 [NOT USED]

2.5.2.3.3 [NOT USED]

2.5.2.3.4 Facilities and Space Requirements – Field Office and Laboratory

The Design-Builder shall provide a Field Office and one Field Laboratory. These shall be separate facilities and shall be in accordance with Standard Specification of the Department and the following:

- The Field Laboratory shall be a minimum of 150 square feet and include a lock box.
- The Design-Builder shall provide an exterior storage facility adjacent to the office structure that is a minimum of 100 square feet. The facility shall be for the exclusive use of the Department to store its testing equipment and testing supplies. This facility must be lockable, accessible by vehicles via an all-weather surface and must be substantially constructed as necessary to meet all requirements for storing nuclear test devices.
- The Field Office shall be a minimum of 500 square feet and include the following, at a minimum:
 - One desk calculator having a minimum of 10 digits for print/display.
 - One lock box.
 - Fax machine that includes a 30-page auto document feeder, transmission speed of 15 seconds per page, a minimum of 10 pages of memory, and a telephone hand set with fax/phone switching.
 - The phone service shall also include a digital, time stamp telephone answering machine and caller I.D. service, and two telephones with service.
 - One T1 line for high speed internet access, plus two additional phone lines with two phones on each line.
 - One dry tone copy machine capable of reproducing 8.5-inch by 11-inch and 11-inch by 17-inch sheets of paper with an automatic paper feed. The Design-Builder shall provide for a contract maintenance agreement of the copy machine for the life of the Contract. The copier shall be capable of 10 pages per minute output minimum with a document feeder capable of 99 pages or greater.

-
- Two office tables 30 inches by 60 inches with adequate supply of chairs for all participants at Project meetings.
 - One hot and cold water dispenser complete with cups and drinkable water supply always on hand.
 - One full size refrigerator/freezer.
 - One 1100-watt microwave oven.
 - One first aid kit.
 - One waterless hand cleaning dispenser in portable toilet.

2.5.2.3.5 Computer Equipment

The computer should be a Pentium IV and Higher.

The computer should have Microstation V8 and CAICE VT or similar. The software should be able to produce drawings to the Department Standards for lightweight Levels, dropout levels, line style ..Etc.

For the Department standard call Jeff Kepley (916) 227-2572

http://www.dot.ca.gov/hq/oppd/cadd/rsc_files/webpage.php

2.5.2.3.6 [NOT USED]

2.5.3 Deliverables

The Design-Builder shall submit to the Department the directory of Approved Key Personnel within seven Days of NTP1.

If the Design-Builder proposes changes to Approved Key Personnel, the Design-Builder shall submit a request in writing setting forth the qualifications of the replacement(s) as required by Section 2.5.2.2 for Approval by the Department.

2.6 Safety Management

2.6.1 General

The Design-Builder shall conduct all Work necessary to meet the requirements of safety management.

2.6.2 Administrative Requirements

2.6.2.1 Design-Builder Safety Management Plan

The Design-Builder shall develop, implement, and maintain a written Safety Management Plan that describes the processes to be followed.

The Plan shall be Project-specific, shall include Work to be performed by Subcontractors, and shall describe processes to control hazards.

At a minimum, the Design-Builder's Safety Management Plan shall:

1. Be consistent with the Project insurance requirements.
2. Describe the participation of safety personnel in all Work activities.
3. Delineate administrative responsibilities for implementing the Safety Program.
4. Identify responsibilities and accountability.
5. Identify full-time dedicated safety professionals or managers covering all production shifts.

6. Describe the process of conducting safety orientation for all employees. The description of the safety orientation process shall include the following:
 - a. A description of the extent and nature of the Project
 - b. A description of any hazards that can typically be expected during the course of Work that is specific to the job assignment
 - c. Required Work practices, job conduct, and injury-reporting procedures
 - d. Any other general information to acquaint the employee with special Work and safety requirements at the Work Site
7. Describe the Design-Builder's drug policy, including the policy at the Work Site and any pre-job Site and post-incident drug testing to satisfy Project insurance requirements.
8. Describe employee-training requirements.
9. Describe safety inspection procedures of Work areas, materials, and equipment to ensure compliance with the Safety Program; methods of record keeping; and correction of deficiencies.
10. Describe incident and emergency response procedures for land based and river based incidents, including response capabilities, evacuation and egress, responsibilities for reporting and investigating incidents, exposures, contingency plans, and the maintenance of safety-related logs.
11. Describe incident reporting procedures.
12. Describe the Design-Builder's Work Site control policy and plans for maintaining Site cleanup, on-Site first aid facilities or medical clinic, and safe access.
13. Identify public safety requirements (e.g., fencing, signs, and barricades).
14. Describe the Design-Builder's hazard communication program.
15. Describe the process of including representatives from the Design-Builder and all major Subcontractors, as well as Department personnel working on the Project.
16. Describe the Design-Builder's method of tracking open safety issues.
17. Describe hazard analysis, tracking, and reduction of risk, logs, and mapping procedures.
18. Describe the Design-Builder's management and auditing of the Safety Management Plan.
19. Describe personal protective equipment (PPE) requirements and policy.
20. Describe safety procedures for Design-Builder's employees working around and handling contaminated materials.

2.6.3 [NOT USED]

2.6.4 Construction Requirements

2.6.4.1 Working Conditions

All Work under this Contract shall comply with the requirements and standards specified by the Williams-Steiger Occupational Safety and Health Act of 1970, 29 U.S.C. §651, et seq., Public Law 91-596, as well as other applicable federal, State, and local laws. The Design-Builder shall not require any laborer or mechanic to Work in surroundings or under working conditions that are unsanitary, hazardous, or dangerous to his/her health and safety as determined under construction safety and health standards promulgated by the U.S. Secretary of Labor.

2.6.5 Deliverables

The Design-Builder shall submit three individually bound copies of the Safety Management Plan and revisions to the plan for Approval within 20 Days of NTP1.

The Design-Builder shall provide verbal notification and a written report to the Department of all incidents arising out of or in connection with the performance of the Work, whether on or adjacent to the Site, which cause death, personal injury, or property damage. The Design-Builder shall verbally notify the Department within one hour from time of occurrence of an event causing public injury. Verbal notification shall include date and time, location, brief description, extent of property damage, and extent of injuries.

The Design-Builder shall provide a written monthly incident summary report to the Department as part of the Progress Report conditions of Section 2.2.2.3.

EXHIBIT 2-A

Quality Manual Template

This exhibit is provided as an electronic file.

3 PUBLIC INFORMATION

3.1 General

The Design-Builder shall perform all Work necessary to meet the requirements associated with Public Information in accordance with the requirements of the Contract Documents and these Technical Provisions.

3.2 Administrative Requirements

Public information goals for the Project shall be consistent with the Department's *Strategic Plan* (see Book 3, Applicable Standards). These include meeting customer expectations with information that is reliable and encourages open communications with and among all audiences.

3.2.1 Standards

1. Department Project Communication Handbook

3.2.2 Public Information Plan

The Department requires a Public Information Plan for this Project to communicate and establish and build trust between the Department, the Project Design-Builder, Project stakeholders, and the general public.

To be effective on all projects, three broad categories of information shall be communicated and coordinated between the Department and the Design-Builder. These are messages that communicate the following:

- The **Vision** of the Project – answers to questions such as why the Project is needed, what Work will be done, how the Project will benefit customers, how the Project fits into the community, and how the Project fits into the State's broader transportation plans.
- The Project's **Progress** – ongoing messages to keep people informed about how the Project is moving forward, whether it's on schedule and on budget, what disruptions or improvements are coming in the near future, and what beneficial innovations are being used.
- **Coping** during the Project – information that helps people deal with inconveniences caused by the Project, such as details about detours, blocked driveways, traffic restoration projects, and, construction and noise impacts on local residents and businesses. This shall include describing informational resources available to the public.

The Design-Builder shall develop and maintain a consistent level of public communication with the goal of establishing public awareness and understanding of the Project. To this end, the Design-Builder shall develop, implement, and maintain a Public Information Plan (PIP) that recognizes the fluid nature of the Project, as well as the fact that the communications program's goals are critical to the overall success of the Project. (The PIP shall incorporate communications processes defined throughout Section 3 and those required in other functional areas, such as determining the construction and noise impacts on local residents and businesses.) The Design-Builder shall develop the PIP consistent with Exhibit 3-A. The Design-Builder shall serve as a facilitator to address public information issues and shall be proactive in providing information and responding to the public.

The Design-Builder's public information staff shall be accessible 24 hours a Day, seven Days a week, and shall respond within two hours of contact to address Project issues (except in cases of emergency situations, in which case response shall be within 15 minutes). The Design-Builder's public information staff shall provide contact information, including home, fax, mobile, and pager numbers, to the Department within two Days of NTP1. The Design-Builder's public information staff shall hold coordination meetings weekly (or as jointly deemed necessary) with the Department.

The Design-Builder shall meet at least weekly with the Department and other appropriate representatives as designated by the Department to review, assess input, and/or modify the Design-Builder's Public Information Plan. Regular communications shall occur with the Department, which includes phone calls and e-mail updates.

The Design-Builder shall use the Public Information Plan as the framework for disseminating and responding to information from the public. The Design-Builder shall become aware of and comply with the California Public Records Act throughout the Project.

Design Builder shall submit their Public Information Plan (PIP) to the Department's District 6 Public information Office (PIO) approval before implementing it.

3.2.3 Customer Groups (Audiences)

The Department has identified a number of customer groups that may be impacted by the Project and require communication with during the Project. The Design-Builder shall describe in its Public Information Plan its approach to communicating with these groups and coordinating with the Department. The identified groups include but are not limited to:

- Area residents
- Property owners
- Commuters
- The traveling public
- Commercial vehicle operators
- City staff and regional government officials
- Business owners, employees, and customers
- Neighborhood and business associations
- News media, specifically the *Fresno Bee* or *Madera Tribune*
- Emergency response agencies, including police, fire, and ambulance agencies
- Utilities
- Water management organizations, environmental permitting agencies, and other local service districts

3.2.4 Crisis Communications

The Public Information Plan shall include a crisis communications approach for responding to emergencies and incidents during the Project. The Design-Builder's crisis communications approach shall include the following:

- Designated staff to respond to the emergency
- Types of potential emergencies
- Approaches to addressing potential emergencies
- Cause of specific disruptions (i.e., whether construction-related or not)
- Actions being taken to alleviate the problem
- Impact to the public and notification procedures
- Anticipated duration of the disruption

3.2.5 Data Collection and Management

The Public Information Plan shall include an approach for the collection, organization, and management of information about the Project and about the public's wants and needs. This requires the Design-Builder to collect, compile, and access information regarding construction and to assess the perceptions and emotions of the public during the course of the Work.

The Design-Builder's data collection and management approach shall account for the ongoing information needs of various customers. For example, residents, commuters, and most other customers will need information about the construction schedule and what roads will be affected and/or closed by construction. Likewise, commercial

vehicle operators will need specific information on any conditions that would restrict or prevent commercial vehicles from using roadways under construction. Emergency response providers shall be notified by the Design-Builder if designated routes for emergency vehicles are altered. All Project customers and stakeholders will require reliable, accurate, accessible, and timely information on when and where construction is taking place.

In addition, the Design-Builder's data collection and management approach shall describe strategies to identify and respond to customers' perceptions and emotions, and stakeholder concerns throughout the duration of the Work. This shall include a detailed description of the information-gathering process and specific timelines developed to ensure timely responses.

In addition to its own innovative strategies and solutions, the Design-Builder shall employ the following methods for collection and management of data.

3.2.5.1 Construction Activities and Maintenance of Traffic Information

The Design-Builder shall collect and maintain current and accurate information of construction activities, including location, estimated duration of activity, type of work being performed, physical impacts (e.g., lane closures, narrowed lanes, commercial vehicle restrictions, etc.), and planned construction detours. The Design-Builder shall update this information as conditions change. The Design-Builder shall also collect information about how Work activities affect traffic flow and movement.

The Design-Builder shall collect and disseminate this information to the Project's public Web site and to the Department. The Design-Builder shall enter the information in the Department's 511 Condition Acquisition and Reporting System (CARS). In developing the functional requirements, the Design-Builder's data collection and management approach shall include the following:

- Type of information to be collected and stored
- Aggregation of data
- Data collection methodology
- User data needs
- Archiving procedures
- Access to information [will vary depending on user – i.e., Department versus general public]

In addition:

- Information gathered by the Design-Builder shall be reviewed for accuracy and forwarded as soon as it becomes available (within a maximum of two hours) to the Department.
- Information gathered by the Design-Builder shall be posted on the Project's public Web site no later than two hours after it becomes available.
- The Design-Builder shall work with the Department to coordinate and develop the technical interfaces between the Project's public Web site, the construction information recorded, and any other relevant information dissemination systems identified by the Design-Builder and/or the Department.
- Changes in information gathered by the Design-Builder shall be posted immediately by the Design-Builder to the Project's public Web site as described in Section 3.2.7.2.1.
- The Design-Builder shall coordinate the dissemination of information (construction, commercial vehicle, incident, etc.) with the Department, other agencies, and relevant customers (e.g., the media) throughout the Project.
- The Design-Builder shall be responsible for the accuracy and reliability of the information provided.

The Design-Builder shall track changes, including changes to short-term construction-related closures or emergency closures, in scheduled construction activities and report on all unscheduled activities as quickly as possible.

The Design-Builder shall meet the following requirements for providing information:

- All planned construction activities shall be recorded no later than 30 Days before planned start date and shall include possible construction noise impacts.
- Construction information updates/changes shall be recorded within 24 hours of the information being made available to the Department and the Project's public Web site.
- Construction updates (i.e., planned closure cancelled, planned nighttime construction noise impacts canceled or completed, lane closed, closure removed, etc. that directly affect the public) shall be monitored by the Design-Builder. The Design-Builder shall immediately notify the Department of changes, post the information on the Web site, and disseminate it through other technologies.
- All information shall be verified for accuracy before release.

The Design-Builder shall maintain basic information, contact names, and phone numbers for other construction projects that may affect traffic conditions on the Project or surrounding local street network. This information shall be included in the construction information maintained by the Design-Builder.

The Design-Builder shall verify, record, maintain, and make all of the above construction information available to the Department for use and dissemination.

The Design-Builder shall operate and maintain the construction information dissemination process for the entire duration of the Work. The process shall operate 24 hours a Day, seven Days a week. Requests for information and system faults shall be acknowledged within two hours of notification and resolved within the following two hours. The Design-Builder shall provide regular reports as requested, summarizing activities and adherence to the Contract requirements.

The Design-Builder shall perform verification of information, collection process, and interfaces to demonstrate compliance with the requirements of this Contract. The Design-Builder shall prepare a detailed plan to describe its approach to meeting the requirements of the Contract.

Recording and dissemination of information shall be operational within 14 Days following NTP1.

3.2.5.1.1 Construction Schedule

Construction notification shall be made available to the Department and publicized by the Design-Builder through its information tools (see Section 3.2.7) seven Days prior to the beginning of construction in any area of the Project.

Notification of construction events shall include the following:

- Description of the activity
- The start of the activity
- The end of the activity

The Design-Builder shall provide current construction information to the Department as an input to incident management strategies to prevent traffic from being rerouted into areas of construction-related congestion.

3.2.5.1.2 Maintenance of Traffic and Access

The Design-Builder shall provide maintenance of traffic (MOT) and access information for the entire Project to commuters, residents, and businesses within a minimum of four blocks on either side of the limits of construction at least 14 Days prior to any construction in the affected area.

The Design-Builder shall include the following elements within the notifications to the public:

- Residents and businesses affected
- Alternate routes and detours

- A contact for further information

3.2.5.1.3 Traffic Conditions

The Design-Builder shall inform the Department of any unusual traffic conditions (such as road obstructions, etc.) within 15 minutes of detection.

3.2.5.1.4 Commercial Vehicle Access and Restriction Information

Seven Days prior to an activity taking place that may restrict or impede the movement of commercial vehicles due to reduced lane widths, reduced height clearances, or lower weight limits, the Design-Builder shall provide the California Highway Patrol, Department's District 6, Department's Office of Truck Services (Transportation Permits), and Department's Project Manager with notice including:

- Description of the event
- The start of the event
- The end of the event

3.2.5.1.5 Emergency Services Vehicle Access

The Design-Builder shall communicate information regarding access for emergency services to the necessary parties by a schedule agreed upon by the Design-Builder and the emergency services providers. This schedule agreement shall be included in the Public Information Plan and the crisis communications approach developed by the Design-Builder and communicated in writing to the Department and the Localities.

3.2.5.1.6 Changes to Access

The Design-Builder shall inform businesses and residents of any changes to access at least seven Days prior to the start of any construction activities that may affect them. Information shall include the purpose of the access change, expected duration, detour options, and Design-Builder contact information. Seven Days prior to start of construction, the Design-Builder shall submit to the Department information regarding changes in access.

3.2.5.1.7 [NOT USED]

3.2.5.1.8 Utility Shut-Offs

Regular communication with businesses and/or residents affected by Utility shut-offs shall be conducted by the Design-Builder to mitigate the impacts of potential Utility disruptions. The Design-Builder shall personally contact all affected businesses and residents and shall maintain a record of each notification. The Design-Builder shall provide a written notice to the affected parties at least 48 hours in advance of the Utility shut-off. Notices shall indicate the expected duration of the outage and provide information indicating how those affected by the outage can contact the Design-Builder. Such notices shall also be provided to the Department and the City of Madera.

The Design-Builder shall provide an emergency Utility contact list of all Utility Owners' representatives with facilities within the Project Site as part of the Public Information Plan. The Design-Builder shall be responsible for keeping the emergency Utility contact list updated on at least a quarterly basis.

3.2.5.1.9 Incident Information

The Design-Builder shall act as an additional source of incident information in the Project. This incident information includes traffic accidents, disabled vehicles, oversized vehicles traveling on the network, Utility disruptions, adverse weather conditions (e.g., wind, ice, rain, and snow), and debris and/or animals on roadways.

As the Design-Builder becomes aware of incidents, the Design-Builder shall report such incidents within 15 minutes of detection.

3.2.5.1.10 Events

The Design-Builder shall compile a weekly listing of special events in the Project area that may be affected by the Work. The Design-Builder shall coordinate, communicate, and provide a plan to minimize conflicts for public events held by public and private entities. (Examples include city festivals and parades.) The Design-Builder shall notify the Department of planned events that may be affected by construction a minimum of 14 Days before each event takes place.

Currently scheduled events that are known include the following:

City	Event	Date(s) of Event
Madera	Caesar Chavez day	March 31
Madera	Memorial day	May, 31
Madera	Fourth of July	July 4

3.2.5.1.11 Nighttime Construction Noise

The Design-Builder shall notify nearby residents in writing of the expected start and completion of construction activities expected to generate nighttime construction noise. Notifications shall be made at least seven Days in advance. Changes in the expected schedule of these activities shall be made within one Day of determination. The Design-Builder shall continually inform the affected residences of these possible nighttime construction noise impacts.

3.2.6 Methods of Disseminating Information

The public interest in the different aspects of the Project will be extensive, ranging from understanding of the construction schedule to the specifics of design and how it fits with community needs and aesthetics. In close cooperation with the Department, the Design-Builder shall provide specific Project information for the public, as well as respond to the public's day-to-day needs and concerns. The Design-Builder shall provide credible, timely information to establish an effective working partnership with the Project's customer groups.

In addition to its own innovative strategies and solutions, the Design-Builder shall use the following methods for managing and disseminating information.

3.2.6.1 Communications Matrix

A communications matrix process shall be developed and used by the Design-Builder to manage the dissemination of information to customer groups and to report to the Department. The Design-Builder shall develop a communications matrix for the customer groups, which will identify the following:

- The customer group(s) requiring information
- Location or region of customer group(s)
- What information is needed
- When information is needed
- Tools to be used to disseminate information
- Results of information dissemination

As part of the communications matrix management process, the Design-Builder shall incorporate a coordination effort that integrates public information, Maintenance of Traffic (MOT), and intelligent transportation systems (ITS) requirements.

The communications matrix shall be used to assess performance during the scope of the Project and shall be updated continuously.

3.2.6.2 Public Contact

The Design-Builder shall work with the Department to facilitate coordinated and consistent efforts when contacting and disseminating information to the public. The Design-Builder shall track all contacts, at a minimum, the names, addresses, e-mail addresses, fax and phone numbers, questions, comments, concerns, dates of contact, and the response provided, using an electronic database capable of producing reports.

The Department has obtained the names and addresses of many residents and businesses located in the Project area. Contacts that already have been made with businesses and residents along the Project shall be incorporated by the Design-Builder with the Design-Builder's contacts.

Reports detailing public contacts shall be provided to the Department on a weekly basis.

3.2.6.3 Telephone Hotline

The Design-Builder shall implement a telephone hotline with trained personnel knowledgeable of the Project as a means of receiving community input, answering questions, and prompting possible solutions regarding Project-related activities. The hotline shall be available to the public 24 hours a Day, seven Days a week and shall be publicized in all Project information materials. The hotline must be a handicap-accessible, free call for the public. An immediate response is preferable for all calls, although a voice mail option is permissible. All voice mail messages shall be replied to within 24 hours of receipt. All calls and resulting actions from this hotline shall be tracked and integrated into the Project's electronic contacts database for the Department's inspection. The Design-Builder, in developing design and conducting its construction activities, shall consider data received from this hotline.

3.2.6.4 Media Relations

An ongoing media relations effort shall occur and be managed by the Design-Builder with direction and support from Department's District 6 Public Affairs Coordinator. The Department will be responsible for conveying Vision messages (as described in Section 3.2) to the media and addressing Project-specific Progress (see Section 3.2) questions such as budget, milestones, etc. The Department and the Design-Builder shall work together to develop key talking points and to convey Coping messages (see Section 3.2), such as day-to-day lane closures, and specific phasing questions.

During the Work, the Design-Builder shall immediately notify the Department of any situations involving the media, and all communications requests shall be tracked by the Department. The Design-Builder shall become familiar with the Department media policy included in the Reference Information Documents (RID). This policy outlines expected Design-Builder behavior when contacted by media representatives.

The Design-Builder shall not use information gained on or from the Project for its own business promotion purposes without written consent of the Department.

3.2.6.5 Community and Business Relations

The Department will develop and implement a community and business relations effort to enhance and build relationships with the neighborhoods and public, including affected businesses, and to provide high-level Vision and Progress messages. As part of the communication matrix process and with oversight from the Department, the Design-Builder shall develop and implement community relations strategies that communicate Coping messages to the public. Coping strategies shall focus on providing the public with the information they need to make short- and long-term decisions about how they can deal with the Work with as little disruption as possible.

3.2.6.6 Government Affairs

The Department will be responsible for federal, State, and local government affairs (except where responsibility is specifically assigned to the Design-Builder, such as for coordination purposes and for securing permits). The Design-Builder shall assist in giving timely information to the Department regarding construction activities, and shall participate in meetings with elected officials and staff as requested.

3.2.6.7 Information Service Providers

Third-party information service providers, such as traffic-information Web sites, may play a valuable role in assisting to disseminate Project-related information to the public. The Design-Builder shall describe strategies to communicate relevant information to these entities via the Department. The Design-Builder will take specific Project information (e.g., lane closures, ramp/loop closures, roadway closures) and provide it to the Department's (511mn.org) Web site.

3.2.6.8 Project Identity

The Design-Builder shall support the Department in efforts to provide key educational messages and to build awareness about the Project. The Department has created a project identity, or "brand," that will allow the various entities of the Project team to present Project information seamlessly to the public. The Design-Builder shall use the Department logo, as well as the Project name, to identify itself as part of the Project team and in its communication vehicles to the public. The goal is to eliminate individualism and to portray all communications about the Project as a partnership between the Department and the Design-Builder. Approval of all Project identity and brand materials will be a cooperative effort between the Design-Builder, the Department and the City of Madera.

3.2.7 Tools for Disseminating Information

In addition to its own innovative strategies and solutions, the Design-Builder shall use the following tools for disseminating information.

3.2.7.1 Project Identification Boards

The Design-Builder shall install signs near the Project to be placed in prominent traffic zones and at the Design-Builder's field office. The signs shall identify relevant Project information, including the Project's public contact information.

3.2.7.2 Electronic Information Dissemination

A wide range of information concerning conditions in the Project area shall be available from the Design-Builder, the Department. The Design-Builder shall employ multiple means to disseminate information about conditions in the Project through existing and Project-specific means. The primary electronic methods will be through Project and Department Web sites, e-mail, fax broadcasts, variable message signs, and the 1-800-427-ROAD (7623) Roadway Information System.

3.2.7.2.1 Web Site

With oversight by the Department's District Public Information Office and following existing Department Project Web site format, the Design-Builder shall maintain and provide Project Information about construction schedules/activities, transit options, alternate routes, and other relevant information. The Design-Builder shall work with Department's District Public Information Office to develop innovative and creative strategies to enhance the project information provided on the Web site. The Design-Builder shall provide, at a minimum, construction information, commercial vehicle restrictions, regular input for a community/construction calendar of events, frequently asked questions (and the answers to those questions), and other relevant information. The Design-Builder shall update this information daily, or more often if needed. The Design-Builder shall be responsible for evaluating user needs, including the type of information that is of interest to specific users (e.g., general public, commercial vehicle operators, etc.), and shall develop the format for displaying information according to the existing Department Project Web site format, located at: <http://www.dot.ca.gov/dist6/media/>

The Department's District Public Information Office shall be involved in all communications between Design Builder and the Department's Information Technology offices. The Department's District Public Information Office shall also have approval authority over all information submitted for updates to website.

3.2.7.3 Emergency Information Dissemination

As part of the crisis communications approach, the Design-Builder shall establish and manage an emergency response telephone tree. All appropriate stakeholder personnel shall be included on this telephone tree for immediate response in the event of an emergency. The telephone tree shall be divided into areas of expertise so the proper people are called for specific emergency situations. The Department Project Manager, Department public information staff, a designated City of Madera representative, and the Design-Builder's Project Manager shall be included on the telephone tree for notification of any emergency that may surface.

3.2.7.3.1 List of Emergency Service Providers

The Design-Builder shall develop and maintain a contact list of emergency service providers as part of the crisis communications approach. The Design-Builder shall provide information to emergency service providers as outlined in the communications matrix and crisis communications approach.

3.2.7.4 Public Meetings and Personal Contact

3.2.7.4.1 Public Information Meetings and Open Houses

The Design-Builder shall conduct weekly construction meetings every Friday in a convenient location for community members in active Project areas when determined by the Design-Builder and the Department. Participants shall include the Design-Builder's Project Manager, the Department Contract Manager, and a designated City of Madera representative. Local participants shown above in 3.2.3 are expected to attend. The Department will provide the meeting facility. If State facility is not available in the project area, Design-builder will provide the meeting facility. The purpose of these meetings shall be to update affected parties, resolve complaints, etc. The Design-Builder's management and public information teams and the Department shall attend all meetings. The Design-Builder shall organize and arrange all Project meetings and extend invitations to appropriate participants as agreed by the Department. The Design-Builder's Project Manager and other Design-Builder-selected personnel shall meet with the Department Project Manager and a designated City of Madera representative at a mutually agreed upon location on Thursdays to plan the Friday morning meeting.

The Design-Builder shall conduct an Open House within 14 Days of NTP to discuss construction staging, maintenance of traffic, and other issues of interest to the community.

3.2.7.4.2 [NOT USED]

3.2.7.4.3 Supplying Information to Third Parties

The Design-Builder shall furnish Project information, including plan sheets, electronic data files (description of content), and construction and design information, to third parties (such as owner's attorneys or agents) within seven Days of contact and notification of the Department. When appropriate, this information shall be furnished via an FTP site or may be disseminated in both paper and electronic format.

3.2.7.5 Information Materials

The Design-Builder, in coordination with the Department, shall prepare information materials for any business, resident, news media outlet, or others to support its communications efforts as necessary in the Project area. These materials shall include tentative schedules, contact names, telephone numbers, Project descriptions and maps. The Department shall review and Approve all content of the information materials, which shall also be available on the Project Web site.

3.3 [NOT USED]

3.4 [NOT USED]

3.5 Deliverables

Five hardcopies of the Design-Builder's final Public Information Plan shall be submitted to the Department for Approval within 14 Days of NTP1. The Department will respond within seven Working Days of receipt of the plan.

The Design-Builder shall submit specific public information dissemination pieces (i.e., faxes, e-mails, collateral materials, and access maps) to the Department for Approval on a schedule agreed to by the Design-Builder and the Department prior to dissemination by the Design-Builder.

Upon Approval of the above mentioned deliverables, the Design-Builder shall provide electronic versions to the Department.

EXHIBIT 3-A

Public Information Plan Template

This document is provided as an electronic file.

4 ENVIRONMENTAL COMPLIANCE

4.1 General

The Design-Builder shall perform all Work necessary to meet the requirements for environmental compliance as set forth in the Standard Environmental Reference (www.dot.ca.gov/ser) and in any approved environmental documentation for Project.

Changes in project scope not covered in these documents require assessing how the changes affect the validity of the environmental documents, compliance with permits, and ability to meet established environmental commitments and may require the preparation and circulation of subsequent/supplemental environmental documentation and the renegotiation and amendment of environmental permits, approvals and agreements. Any such additional documentation or permit modifications must be approved by the Department and complete the CEQA/NEPA before construction on the project scope changes may occur.

4.2 Administrative Requirements

4.2.1 Standards

The Design-Builder shall design and construct the project specific environmental commitments in accordance with the standards, below. The Design-Builder shall use the most current version of each title, in accordance with Book 1, Section 1.5 of this contract.

In the event of a conflict among the below standards, requirements and references, the Department shall have the right to determine, in its sole discretion, which applies. Contractor shall request Department’s determination respecting the order of precedence among conflicting standards, requirements and references promptly upon becoming aware of any such conflict.

Environmental Standards and Requirements

Priority	Agency	Title
1	Department	Exhibit 4-A, Project Environmental Document
2	Department	Department-Obtained Permits, Agreements and/or Approvals
3	Department	Standard Environmental Reference
4	Department	Special Provisions
5	Department	2006 Revised and New Standard Plans
6	Department	Standard Plans May 2006
7	Department	Design-Build Modifications to the Standard Specifications
8	Department	Standard Specifications
9	Department	Project Planning and Design Guide
10	Department	Construction Site Best Management Practices (BMPs) Manual
11	Department	Storm Water Pollution Prevention Plan (SWPPP) and Water Pollution Control Program (WPCP) Preparation Manual
12	Various	Technical Memoranda
13	SWRCB	Notice of Intent

- 14 Department Volume II, CT Environmental Handbook; Cultural Resources
- 15 Department Volume III, CT Environmental Handbook; Biological Resources
- 16 Department Volume IV, CT Environmental Handbook, Community Impact

4.2.2 References

The references listed below are supplementary guidelines for all environmental related analysis, design and construction.

Environmental Publications References

Agency	Title
Department	Surveys Manual
Department	Ready-To-List and Construction Contract Award Guide (RTL Guide)
Department	Construction Manual
Department	California Test Methods
U.S. ACE	Wetlands Delineation Manual

4.2.2.1 Permits

Unless otherwise indicated in Table 4-1, all permits required for the Project are the responsibility of the Design-Builder, including any permit that must be amended, renewed, or modified. The Design-Builder shall provide the Department with copies of all completed permit applications and attachments, correspondence, and environmental management plans for the Department review, comment, and approval at least 3 days prior to Design-Builder approval of permits.

REQUIRED PERMITS, AGREEMENTS, & APPROVALS	N/A	COORDINATE	PREPARE APPLICATION	OBTAIN	IMPLEMENT	RENEW	AMEND
404 USACOE	X						
401 RWQCB	X						
NPDES SWRCB				X	X		
State Waste Discharge Requirements (Porter Cologne) RWQCB							
FESA Section 7 USFWS	X						
BO Section 7 USFWS	X						
FESA Section 7 NOAA/NMFS	X						
BO Section 7 NOAA/NMFS	X						
FESA Section 10 USFWS	X						
EFH - NOAA/NMFS	X						
Coastal Development Permit CCC	X						
Fed. Coastal Zone Mgt. Act – Consistency Determination CCC	X						
BCDC Permit	X						
Fed. Coastal Zone Mgt. Act – Consistency Determination BCDC	X						
1602 DFG	X						
2080.1 DFG	X						
2080(B) DFG	X						
Air Quality Permits	X						
Other (specify)							

4.2.3 Meetings

The Department and the Design-Builder shall meet at the request of either party, as necessary, to coordinate on matters relating to Environmental compliance during the design and construction stages. The requesting party shall provide the other parties with not less than five (5) days notice of such meetings. The Design-Builder shall prepare and distribute a record of the minutes to the meeting within five (5) days.

4.2.4 Environmental Management Plan

The Design-Builder shall submit an Environmental Management Plan (EMP) that describes how the Design-Builder will meet the Project's Environmental Commitments contained in the project's Environmental documents, environmental studies and permits, agreements and approvals. The EMP, at a minimum, will contain the following elements:

- Environmental personnel and training
- Environmental notification contact list
- List of Environmental Commitments
- Schedule of EMP activities (see section 4.4.4)
- Air Quality Management Plan

Storm Water Data Report (SWDR)

- Storm Water Pollution Prevention Plan (SWPPP or WPCP)
- Sedimentation and Erosion Control Plan

All of the above plans shall be developed by the Design-Builder and reviewed and approved by the Department and the appropriate jurisdictional agency, if any.

4.2.5.1 Environmental Personnel and Training

4.2.5.1.1 Environmental Personnel

The Design-Builder shall designate an Environmental Management Team consisting of those persons responsible for implementing the EMP. The following positions shall be included:

Environmental Manager

The Design-Builder shall provide an Environmental Manager to supervise the work necessary to acquire any permits required for the Project. The Manager shall supervise the work necessary to develop all permit applications, drawings, correspondence, and environmental management plans. This work will include assembling a permit application package as required by each permitting agency. The Manager shall also ensure that the Design-Builder is complying with all requirements of the Permits. The status of permits applications and permit compliance shall be reported in each Environmental Management Plan.

Other duties will include, but are not limited to, perform constructability reviews during PS&E to assure compliance with all environmental commitments, maintain files, perform field reviews, and attend preconstruction meetings, assist conducting surveys as needed.

Water Pollution Control Manager

The Design-Builder shall provide a Water Pollution Control Manager (WPCM) and/or Storm Water Pollution Prevention Plan (SWPPP) preparer who meets the qualifications of the Construction

General Permit, *Caltrans Standard Special Provisions*, and current Storm Water Quality Handbooks, Storm Water Pollution Prevention Plan (SWPPP) and Water Pollution Control Program (WPCP) Preparation Manual. The Design-Builder's WPCM shall be responsible for preparation and compliance with the Caltrans NPDES permit and Construction General Permit.

Certified Erosion and Sediment Control Supervisor

The Design-Builder shall assign a Certified Erosion Control Supervisor with detailed knowledge, skills, and experience in each of the following:

- Permit requirements and application processes, design standards, specifications, and special provisions for storm water facilities.
- Selection, design, and implementation of permanent best management practices. Design and implementation of temporary best management practices in compliance with the Madera 99 Chowchilla Rehab Storm Water Quality Master Plan

The Certified Erosion Control Supervisor shall be responsible for the installation and maintenance of all temporary and permanent erosion and sediment control during the life of the project. The Certified Erosion Control Supervisor shall perform the required weekly erosion control inspection reports.

Installer

The Design-Builder shall assign a WPC Manager that meets the qualifications and training required for the following erosion control activities: seeding, mulching, silt fence or other perimeter sediment control device installations, storm drain inlet protection, compost installation.

Acoustical Engineer

The Design-Builder shall assign an Acoustical Engineer with detailed knowledge, skills, and experience in each of the following:

- At least five years experience in conducting traffic noise studies in the State of California.
- Must be a Registered Engineer or Licensed Geophysicist in the State of California or may be INCE certified in acoustics.

4.2.5.1.2 Environmental Protection Training

The Design-Builder shall design and implement an environmental protection-training program for all of the Design-Builder's employees and Subcontractors (including truck drivers and equipment operators). Every employee of the Design-Builder who works on the Project (management through workers, including each new employee who begins work after Project commencement) and all of the Design-Builder's Subcontractors shall participate in an environmental protection-training program. The training program shall orient employees and Subcontractors to the following:

- Overall importance of environmental issues in achieving a successful project
- Particular environmental sensitivities of the Project
- Environmental commitments, including terms and conditions of environmental permits, approvals and agreements
- Erosion and sediment control procedures in accordance with the SWPPP including the functions and proper installation of Best Management Practices (BMPs) based on the Special Provisions.

- Proper procedures for spill containment
- Proper procedures in the event that unanticipated hazardous materials or asbestos are encountered.

Assistance will be provided regarding clarification and understanding of the Department environmental goals and policies. The Design-Builder shall notify the regulatory agencies and Project staff of the training sessions and invite them to participate.

4.2.6 Coordination with Other Agencies and Disciplines

The Department will assist in the coordination with affected interests and regulatory agencies. The Design-Builder shall document the resolutions of issues for the correspondence file, including meeting minutes and memoranda for the record. The Design-Builder shall document the permit requirements and contacts with the permitting agencies.

4.2.7 Certification Requirements

The Design-Builder shall perform all laboratory testing at a AMRL-accredited lab, Department certified and approved for the material being tested.

4.3 Design Requirements

The Design-Builder shall design all elements of the project affecting Environmental Compliance in accordance with the standards and regulations listed in this Section.

4.4 Construction Requirements

4.4.1 Environmental Commitments

The environmental commitments include all terms and conditions of environmental permits, agreements and approvals as well as commitments set forth in the project's environmental documents and environmental studies; the Design-Builder's Environmental Manager will create a detailed list of actions required to comply with environmental commitments and shall assign responsibility for each action to an appropriate member of the Project team. The list shall include environmental requirements and include recognition of Project-specific issues, procedural steps for environmental compliance, and particular actions planned to comply with the commitments and governing regulations.

Unless otherwise set forth in this RFP, Design-Builder shall be responsible for complying with, implementing and maintaining all environmental commitments during the life of the Project to avoid and minimize potential environmental impacts. Design-Builder shall ensure the Project design is in compliance with all applicable environmental laws, regulations and executive orders and shall prepare plans and procedures to assure and document compliance.

4.4.1.1 Cultural Resources

If archaeological resources are discovered at the job site, do not disturb the resources and immediately:

1. Stop all work within a 60-foot radius of the discovery
2. Protect the discovery area
3. Notify the Department

4.4.1.2. Hazardous Waste and Contamination

4.4.1.2.1 Asbestos and Hazardous Substances

In compliance with Section 25914.2(a) of the Health and Safety Code, upon discovery of asbestos or a hazardous substance not described in this RFP, immediately stop working in the affected area and notify the Department.

4.4.1.2.2 [Not Used]

4.4.1.2.3 Removal, Handling, and Transportation of Hazardous Materials

Treated wood waste (TWW) will be generated on the job. The Design-Builder shall follow the procedures contained in SSP 14-010 for handling, storing, transporting, and disposing of treated wood waste (TWW).

4.4.1.2.4 Removal and Disposal of Yellow Thermoplastic and Paint

This work includes removing existing traffic stripe and pavement marking at the locations shown on the plans.

The Design-Builder shall submit a lead compliance plan under Section 7-1.07, "Lead Compliance Plan," of the Standard Specifications to address lead in the waste residue from removal of thermoplastic and painted traffic stripe and pavement marking and lead in soil (see Aerially Deposited Lead).

Waste residue from removal of thermoplastic and painted traffic stripe and pavement marking is a non-hazardous waste residue and contains lead in average concentrations less than 1000 mg/kg total lead and 5 mg/L soluble lead. This waste residue does not contain heavy metals in concentrations that exceed thresholds established by the Health and Safety Code and 22 CA Code of Regulations and is not regulated under the Federal Resource Conservation and Recovery Act (RCRA), 42 USC § 6901 et seq.

4.4.1.2.5 [Not Used]

4.4.1.2.6 [Not Used]

4.4.1.2.7 [Not Used]

4.4.1.2.8 Aerially Deposited Lead

Lead is present in earth material within the project limits at average concentrations below 1,000 mg/kg total lead and below 5mg/l soluble lead. Each material within the project limits is not a hazardous waste and does not require disposal at a permitted landfill or solid waste disposal facility.

ADL is present within the planned ROW limits as indicated in the following reports:

1. Site Investigation (SI) Report, Aerially Deposited Lead Study by IT Corporation dated August 16, 2000 (See RID)
2. Aerial Lead Site Investigation Report by Geocon dated March 1998. (See RID)

The Design-Builder shall use SSP 15-027 "Earth Material Containing Lead" in Section 5 of book3.

4.4.1.3 Noise

Construction Noise

The Design-Builder shall perform work within the permissible noise levels, work schedule limitations, and procedures provided for in this Section and applicable Federal, State, County and municipal codes, regulations, and standards.

Other than those provided herein, the Design-Builder shall be responsible for obtaining permits, variances, equipment certifications, and other documents required by applicable Federal, State, County and municipal codes, regulations and standards.

The noise level requirement shall apply to the equipment on the job or related to the job, including but not limited to trucks, transit mixers or transient equipment that may or may not be owned by the Design-Builder.

As this Project will occur in a heavily populated urban area, the Design-Builder shall include in the EMP a detailed listing of the proposed construction noise mitigation measures that will be used during daytime and nighttime hours. Possible construction noise mitigation methods could include:

- Limiting the time and duration of the noisiest nighttime construction activities.
- Constructing temporary noise barriers or curtains around stationary equipment or other noise-producing construction activities that must be located close to residences to decrease noise levels at nearby sensitive receptors.
- Using resilient bed liners in dump trucks to be loaded onsite during nighttime hours.

The Design-Builder shall provide at least seven (7) days notice to affected communities for any necessary blasting and/or loud construction activities, such as pile driving or jack hammering.

The Design-Builder shall turn off construction equipment during prolonged periods of nonuse to eliminate noise.

The Design-Builder shall maintain all equipment and train its equipment operators in good practices to reduce noise levels.

The Design-Builder shall perform aggressive public information activities to notify nearby residents of the expected start and completion of noise producing construction activities.

The Design-Builder shall locate stationary equipment away from receiving properties to decrease noise.

The Design-Builder shall, at all times, be responsible for addressing the noise related concerns and policies of SJVAPCD, FHWA, local governments, and roadside neighbors throughout the design and construction of the Project.

The Design-Builder shall implement a training program to ensure all employees and Subcontractors are educated as to the construction noise abatement requirements.

4.4.1.4 Air Quality

Construction

The Design-Builder shall comply with Standard Specification (as amended) 14-9.01 AIR POLLUTION CONTROL and 14-9.02 DUST CONTROL.

The provisions of the Department Standard Specifications, Section 14-9.01F “Air Pollution Control” and Section 14-9.02 “Dust Control” also require the Design-Builder to comply with the San Joaquin Valley Air Pollution Control District’s rules, ordinances, and regulations.

The Design-Builder shall comply with the SJVAPCD Rule 9510 (Indirect Source Review Rule). This rule applies to construction equipment emissions for transportation projects that exceed 2.0 tons of PM 10 and/or NOx air pollutants. The Design-Builder is responsible for the Indirect Source Review Air Impact Analysis and any applicable fees and will complete a Dust Control Plan approved by the San Joaquin Valley Air Pollution Control District (SJVAPCD).

Burning of wastes is prohibited. The Design-Builder shall remove and dispose of scrap and waste material in accordance with laws, codes, regulations, ordinances and permits.

The Design-Builder shall use construction equipment designed and equipped to prevent or control air pollution in conformance with all applicable regulations of EPA, State and local authorities. Maintain evidence of make available for inspection such design and equipment.

The Design-Builder shall establish and maintain records of routine maintenance program for internal combustion engine powered vehicles and equipment used on the Project and shall keep records available for inspection.

4.4.1.5 Water Quality

Best Management Practices (BMPs) need to be selected and implemented by the Design-Builder in accordance with Book 2, Section 22.

The Design-Builder, as required in Standard Specifications Section 7-1.01G, must address all potential water quality impacts that may occur during construction.

4.4.1.6 Waters and Wetlands

The Design-Builder shall comply with all regulatory requirements related to waters and wetlands as stated in the environmental document and the environmental permits, agreements, and approvals.

4.4.1.7 Wildlife and Vegetation

The Design-Builder shall provide notification if either of the following occurs:

- Species are discovered within the Project area that are identified in the Project's environmental documentation based on the federal or State threatened or endangered species list
- New threatened or endangered species are listed or discovered within the Project area

General Migratory Bird Treaty Act

The Design-Builder shall comply with the Federal Migratory Bird Treaty Act (15 USC 703-711) 50 CFR Part 21 and 50 CFR Part 10, and the California Department of Fish and Game Code Sections 3503, 3513, and 3800, that protect migratory birds, their occupied nests, and their eggs from disturbance or destruction.

- The Design-Builder shall be responsible for completing the migratory bird nest survey within the Project limits prior to construction.
- The Design-Builder is required to provide documentation identifying the number of nests removed and whether or not the nests are occupied with eggs or nestlings.

4.4.1.8 Erosion and Sediment Control Mixing SWPPP with Final Measures

The Design-Builder shall use both temporary and permanent erosion and sediment control measures. Temporary measures shall be used during construction and permanent measures shall be used for the long-term stabilization of disturbed areas. Shaping and reestablishing vegetation are the basic erosion prevention methods.

SWPPP requirements for Temporary Erosion and Sediment Control During Construction – The Design-Builder shall develop an erosion and sediment control plan with design details for each stage of construction. The Design-Builder shall control erosion and limit its negative impacts. The Design-Builder shall use best management practices for temporary erosion and sediment control, including temporary erosion control ponds. Temporary erosion control best management practices include correct shaping, temporary seed, mulch, blanket, and other devices. Other devices may include gravel bag (berms) barriers, temporary drains for fill slopes, or temporary flumes to safely carry water down a slope and other items, such as ditch checks, earth diversions, and other diversions.

Permanent Erosion and Sediment Control – Permanent erosion control measures are primarily designed to function with established vegetation after projects are complete. The Design-Builder shall use best management practices for permanent erosion control. The Design-Builder shall follow the requirements in Section 14 of the Project requirements (Highway Planting and Irrigation) for erosion control.

4.4.2 Environmental Monitoring and Reporting

The Design-Builder shall include an environmental monitoring report in the EMP, which shall indicate times, locations, and other monitoring parameters.

4.4.2.1 Weekly Reports

The Design-Builder is required to submit weekly reports regarding environmental commitment compliance to the Department. The content of the weekly reports shall document evidence of the Design-Builder's performance and include the following:

- Name of environmental monitoring inspector
- Date of monitoring
- Weather conditions
 - Location
 - Resource(s) addressed
 - Activities being monitored
 - Compliance status, including the locations and nature of violations
- Recommended remedial actions for any identified non-compliance

4.4.2.2 Monthly Reports

The Design-Builder shall combine the weekly report forms into a document that summarizes the month's environmental monitoring activities and submit for the Department Approval.

4.4.3 Environmental Notification Contact List

The Design-Builder shall prepare an Environmental Notification Contact List that includes all contact persons and reporting and notification requirements for unforeseen potential environmental impacts, encountered during the course of the Project. The Environmental Notification Contact List shall:

- Include all contact Persons representing the Design-Builder, the Department, governmental entities, and regulatory agencies regarding environmental matters.
- Specify the chain of contact.
- Include for each contact the person's name; agency or corporate affiliation; address; e-mail address; home (if available), cellular, office telephone number(s); and fax number.

The list shall specify, at a minimum, the appropriate contact person(s) for reporting and notification of the following events:

- Design-Builder-caused hazardous material spill
- Discharge to groundwater
- Discovery of:
 - An active bird nest (with eggs or young)
 - Cultural or historic artifacts
 - Human bones or remains
 - Paleontological remains
 - Wildlife injured during construction activities
 - Hazardous materials such as petroleum-contaminated soils, asbestos-containing materials, solid wastes, and other regulated materials
 - Disturbance of any threatened or endangered species or its habitat
 - NPDES inspections by RWQCB
 - Illicit discharges of water and/or sediment leaving site
- Occurrence of Project activities:
 - In waters or wetlands
 - Outside the planned Right of Way limits or other than specified in the project environmental document and environmental permits, agreements and approvals
- Violation of permits and regulations such as:
 - Clean Water Act Section 401—Water Quality Certification
 - Clean Water Act Section 402—National Pollutant Discharge Elimination System
 - California Rules and Statutes
 - Local watershed district or water management organization requirements
- Any pollution issue not covered in items listed above

The Design-Builder shall determine the appropriate first point of contact for other environmental issues.

4.4.4 Schedule

The Design-Builder shall include with the EMP a schedule of activities for environmental related to Project phasing.

The Design-Builder shall include a schedule for implementation of the environmental protection-training program in the EMP. The schedule shall include training sessions at key times (e.g., prior to construction in sensitive areas or construction timing restrictions to protect threatened and endangered species) to update workers on specific restrictions, conditions, concerns, or requirements.

4.5 Deliverables

4.5.1 Environmental Management Plan (EMP)

The Design-Builder shall submit an EMP 90 days prior to construction that must be approved by the RE prior to construction. Response to the EMP submittal will be given within 15 Days.

4.5.2 Technical Studies and Plans

The Design-Builder shall submit the following documents and must receive Approval prior to construction:

- Storm Water Pollution Prevention Plan and amendments, as required, to reflect Project development and staging
- Completed permit applications and permits as issued
- Environmental Notification Contact List

The Design-Builder shall submit the following documents for approval.

Contaminated Materials

- Lead Compliance Plan - Shall be submitted for Approval.

4.5.3 Environmental Monitoring Reports

The Design-Builder shall submit copies of the environmental monitoring reports on a monthly basis or as directed.

4.5.4 Final Design Documents

The Design-Builder shall submit final design documents when design is complete, including office and field generated design changes. Final design documents include:

- Plans
- Shop drawings
- Design calculations
- Reports/Project documentation
- Specifications and Special Provisions

4.5.5 As-Builts Documents

Upon completion of the Project and prior to Final Acceptance, the Design-Builder shall deliver to the Department a complete set of as-built documents and design files that incorporate all design changes and details of Accepted Work that occurred throughout the Project. As-Built Documents must be submitted in both hardcopy and electronic form. The As-Built Documents shall meet the format and content requirements of Final Design Documents.

EXHIBIT 4-A

Project Environmental Document - Categorical Exclusion

All exhibits are provided as electronic files.

5 [NOT USED]

6 UTILITIES

6.1 General

Design-Builder shall perform all necessary work associated with Utility Work in accordance with the Contract Documents. Responsibilities include, but are not limited to; research existing utility information, identify utility conflicts, review relocation plans, approve relocation plans, and coordinate/monitor the physical utility relocation. Design-Builder may be required to perform utility relocation design work or/and physical relocation under a separate Work Order.

The Department's standard utility relocation policy is to identify, design, and relocate the entire facility at once. It is also the most economical approach. Other alternatives to this approach may be considered, but Design-Builder shall accept the liability of any additional costs-

6.1.1 Utility Involvement

Design-Builder shall work with the Department when utility facilities are involved. The Department single-point of contact will direct the involvement to appropriate R/W function depending on whether the facility is public or private utility.

6.2 Administrative Requirements

6.2.1 Responsibility

Design-Builder shall take all actions necessary to identify and confirm the existence and exact location, size and type of all utility facilities within the limits of the Project, including all potentially impacted service lines and service laterals. Design-Builder shall provide to the Department the Verification Maps with all known utility information plotted.

The Department will coordinate with utility owners to obtain Utility Verification information for the entire project limits and forward all the data collected to the Design-Builder.

Design-Builder shall plot all utility data onto the project plans and identify all potential utility conflicts according to the Department's Design and Encroachment Policy (Section 600 of Encroachment Manual).

Design-Builder shall provide the Department the conflict maps for each Utility facility in conflict.

The Department shall contact the owners of the Public Utility facilities and request the required Relocation Plan. In the event that the owner cannot perform the design of the Relocation Plan, the Department may request the Design-Builder to perform this activity under a specific Work Order.

Design-Builder shall review the Relocation Plan and certify to the Department in writing that the Relocation Plan resolves the conflict and meets the construction schedule.

If the Relocation Plan is approved by the Design-Builder, the Department shall determine the cost liability and issue a Notice to Owner to require the owner to perform the physical relocation. In case the Relocation Plan is not approved by the Design-Builder, the Design-Builder shall provide detailed reason, and the The Department shall request the owner to revise its plan accordingly.

At the Utility Owner's request, the Department may request the Design-Builder to perform part or all of the physical relocation work. This request would be in writing under a specific Work Order.

A copy of the Notice to Owner shall be forwarded to the Design-Builder. The Design-Builder shall make arrangements with the Utility Owner to schedule the relocation and monitor the physical relocation to ensure the work has been performed as proposed in the Notice to Owner.

6.2.1.2 Design-Builder Responsibilities

6.2.1.2.1 Relocation Communication

The Design-Builder shall document all communications by the Design-Builder prior to the Proposal Due Date to coordinate the physical relocation activities with Utility Owners. This includes documentation of telephone conversations, e-mails, and meeting minutes. The Design-Builder shall supply this information to the Department no later than 24 hours after the Department's request.

6.2.1.2.2 Other Design-Builder Requirements

Construction of the Project will affect both existing and planned Utilities. The Design-Builder shall coordinate and cooperate with the Department and the Utility Owners to ensure that all Utility Work (whether performed or furnished by the Utility Owners or by the Design-Builder) is performed promptly and in close coordination with the Design-Builder's performance of the Project. The physical limits of the Design-Builder's obligation for the performance of Utility Work shall extend as far as necessary or advisable to accommodate or permit construction of the Project (taking into account the requirements of the Utility Owners, governmental persons with jurisdiction, and adjacent property owners).

The Design-Builder's obligations with respect to each impacted Utility shall include the following activities, all of which shall constitute a part of the Work:

- 2 Identification and verification of all existing Utilities located within the project limits or otherwise impacted by the Project.
- 3 Upon the Department's request under a specific Work Order, the Design-Builder shall design or/and perform the physical utility relocation.
- 4 The Design-Builder shall inspect and monitor all of the physical relocations. The Design-Builder shall document the progress in detail and provide information to the Department upon request.
- The Design-Builder shall be responsible for Identification, verification, and Approval/Certification that the location of all existing Utilities and the design and construction of proposed Utility Relocations are compatible with the remainder of the Project. Whether the Utility Owner or the Design-Builder performs the Utility Work, the Design-Builder will incorporate this information into the Project plans and provide coordinates, profile information, potholing results that confirm all existing Utilities and conflicts for Utility Relocations, and surveys of pertinent points in the field that show the exact placement of all Utility facilities. The Design-Builder will incorporate this information into its CADD drawings, and ultimately, on the Design-Builder's As-Built Documents. If the Utility Owner performs the design and construction of the Utility Relocation, the design information will meet only the standard of quality necessary for the Utility Owner to construct the Utility Relocation.
- The Design-Builder is excluded from the following obligations assigned to the Department:
 - 5 Collecting payments due from the Utility Owners and/or reimbursing Utility Owners for their costs of performing Utility Work required under the Notice to Owners.
 - 6 Negotiating with Utility Owners to resolve issues relating to the determination of legal responsibility for costs between the Department and the Utility Owner

The Design-Builder shall perform all efforts with respect to each impacted Utility without regard to any of the following:

- Whether or not the Utility and/or necessity of the Utility Work was identified before the Proposal Due Date.
- 7 Whether or not the Design-Builder is entitled to a Change Order with respect to such Utility Work.

The allocation of responsibility for any Utility Work to a Utility Owner will not relieve the Design-Builder of the obligation to coordinate with the Utility Owner as necessary for the Utility Work to be performed or of

the obligation to perform any other Utility Work not specifically assigned to such Utility Owner. The circumstances under which the Design-Builder shall be entitled to a Change Order for Utility Work are set forth in Book 1.

In considering the locations and the potential impacts of Utility Work on the Project, the Design-Builder shall avoid Utility Work to the extent practicable; otherwise, the Design-Builder shall minimize the potential costs and delays of Utility Work to the extent practicable and allowable. Any Utility installed in a new location within the R/W shall be installed in a location as proposed by the Design-Builder, based on coordination with all affected parties and subject to issuance of a Utility permit by the Department.

6.2.2 Procedures and Agreements

6.2.2.1.1 Utilities Identified at the Time of the RFP

The Department has issued Notices and Orders to all Utility Owners for all identified Utilities that may be impacted by the Project. There may be Utility Owners that have affected Utilities but that have not entered into a MUA by the Proposal Due Date. The Design-Builder is responsible for all coordination activities with Utility Owners that have not entered into a MUA by the Proposal Due Date. The Design-Builder shall contact all such Utility Owners to ascertain the location of all existing utilities, if any, before performing excavation operations. The Design-Builder shall conduct operations in the vicinity of existing Utilities in a manner that will prevent damage to any Utility.

The Design-Builder is responsible for locating and verifying all existing utility facilities within the project limits.

The Design-Builder shall mark the proposed excavation area before contacting Underground Service Alert. The Design-Builder shall call Underground Service Alert at least 48 hours (excluding Saturdays, Sundays, and holidays) before starting excavation operations.

The Design-Builder shall coordinate Work with Utility Owners so that Utility Work may progress in a reasonable manner, duplication of work may be reduced to a minimum, and services rendered by Utility Owners will not be unnecessarily interrupted.

When the Design-Builder works near electrical power lines, the Design-Builder shall work with the lines energized if the Work can be done safely in compliance with the Cal OSHA Regulations or make arrangements with the power company, at Design-Builder's sole expense, to

- a. temporarily shut off the power,
- b. temporarily insulate the line(s),
- c. bypass the power from the work area, or
- d. make other arrangements necessary for a safe work place.

The Department makes no warranty, guarantee, promise, or representation as to whether the Utility Owner will temporarily shut off power, insulate its line(s), or charge the Design-Builder a fee for preparing a safe work area for the Design-Builder.

The Design-Builder shall not start construction operations adjacent to energized utility facility until arrangements that are satisfactory to the Utility Owner have been made by the Design-Builder for the protection of the Utility and continuation of its service. Should the Design-Builder's equipment come in contact with or damage a Utility in any way, even though there may be no apparent evidence of breakage or harm, the Design-Builder shall promptly notify the proper authorities and cooperate with those authorities in determining damage and restoring interrupted services if needed. Where contact is made with a Utility, the Design-Builder shall suspend operations immediately and vacate the area until it has been determined by the Utility Owner that it is safe to resume operations.

The Design-Builder shall employ special equipment, construction methods, and hand labor, if necessary, to accomplish the planned Work adjacent to Utilities without damaging them. At no time shall the Design-Builder interfere with persons engaged in protecting or moving Utility property or in operating the Utility.

6.2.2.1.2 Newly Discovered Utilities

If the Design-Builder discovers Utilities not identified or not identified with “reasonable accuracy” as defined in Book 1, the Design-Builder shall immediately notify the Department. The Department will not be liable for delay to Design-Builder.

6.2.2.2.2 Notice to Owner

When the Design-Builder has achieved a level of design to determine Utility conflict(s), the Design-Builder will coordinate with the respective Utility Owner through the Department to develop a proposed resolution and pertinent information required.

If the Utility Owner requests the Design-Builder to design the relocation or perform the physical relocation, the Department will then enter into a Work Order with the Design-Builder to perform the task on behalf of the responsible party of the Utility Work. The Work Order will also describe applicable terms and conditions for such Utility Work activity.

Under the Design by Design-Builder Work Order, the Design-Builder shall obtain the specifications from the owner and prepare the Relocation Plan for the specific facility. The Design-Builder is responsible to secure the owner’s approval prior to implementing the design.

Under the Construction by Design-Builder Work Order, the Design-Builder shall obtain the Relocation Plan from the owner and perform the physical relocation works.

Book 2’s provisions regarding the Design-Builder’s obligations to provide quality management will prevail over any contrary provision in the Work Order.

6.2.2.3 Utility Permits and Construction Easements

When the Design-Builder is responsible for performance of the construction of the Utility Work, although it is the responsibility of the Utility Owner to obtain the Department Utility permits, the Design-Builder shall coordinate with the Utility Owner to obtain all construction-related local entity Utility permits, Department Utility permits, and/or Construction Easements or agreements. The Design-Builder shall comply with such Utility permits and Construction Easements or agreements. Separate permits may be required for Work on streets under local entity jurisdictions. A Utility permit from the Department is required for any new Utility facility and for Betterments within the Department R/W.

The Department is responsible to secure any necessary Encroachment Permit for relocation when the Utility Owner or its contractor will perform the work.

If the Utility Owner performs the relocation, the Utility Owner is responsible to secure the construction easement if needed. If the Design-Builder performs the task, the Department is responsible to secure the construction easement in coordination with Design-Builder.

6.2.2.4 Utility Tracking Report

The Design-Builder shall maintain a Utility Tracking Report that lists all Utilities affected or potentially affected by the Project. The Design-Builder shall design and submit the Utility Tracking Report form to the Department for approval before use.

The Utility Tracking Report shall contain not less than the following information for each Utility listed thereon:

- The name of the Utility Owner and a unique identification number for tracking;
- A brief description of the Utility by size and type;

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- The location of the Utility, based upon Project control datum or by station and offset;
 - Once a Work Order has been executed, the party responsible for performance of such Utility Work;
 - The nature of the Utility Owner’s existing right of occupancy of the R/W for such Utility;
 - The scheduled start and completion dates of construction of the Utility Work;
 - The actual start and completion dates of construction of the Utility Work;
 - The status of construction for the Utility Work, including percentage complete; and
 - Such other information as the Department may request.

The first Utility Tracking Report shall identify all changes from and additions to the information provided by the Department that is used by the Design-Builder in the creation of the UDS. Each subsequent version of the report shall identify all changes from the previous version. The report shall be sortable so that data can be reported by the following parameters: the utility identification number, the Utility Owner, the scheduled start-of-construction date, and the scheduled completion date.

6.2.3 Coordination and Cooperation

All Utility Work shall require cooperation between the Design-Builder, the Department, and the Utility Owners. The Design-Builder shall be responsible for all coordination with the affected Utility Owners in order to accomplish the Utility Work. In the discharge of its coordination responsibilities, the Design-Builder shall:

- provide to the Utility Owner , as soon as practicable, an estimated schedule for their respective Utility Work and notify the Utility Owners of any significant changes to the schedule as soon as practicable;
- keep Utility Owners fully informed of Project schedules and changes that affect or may affect their Utility facilities;
- consider Utility Owners’ needs for the allocation of resources to perform their Utility Work;
- keep Utility Owners involved in making the decisions that affect their facilities so Utility Owners are able to provide uninterrupted service to their customers, or be subject to the least interruption practicable; and
- coordinate the Utility Work to avoid multiple Utility Relocations of the same Utility.

6.2.3.1 Utility Coordination Meetings and Correspondence

The Department and the Design-Builder shall be available to meet at the request of the other party, as necessary, to discuss and resolve matters relating to the Utility Work. The requesting party shall provide the other party with not less than seven days prior notice of such meetings.

6.2.3.1.1 Meeting Minutes and Correspondence

The Design-Builder shall produce minutes of meetings with Utility Owners and/or Department and shall distribute copies of the minutes to the Utility Owner and the Department no later than seven Days after each meeting date. The Design-Builder shall provide the Department copies of all correspondence between the Design-Builder and any Utility Owner no later than seven Days after receiving or sending it.

6.2.3.2 Scheduling

The UISs indicate the estimated amount of time required for the Utility Owners to design and/or construct their Utility Work where applicable. The foregoing time frames, and any time frames for design, construction, and/or performance of other tasks or reviews stated in the MUA, shall be considered estimates only and may not be relied upon by the Design-Builder for any purpose.

6.2.3.3 Cost Estimates

The Department will reimburse a Utility Owner for actual costs in connection with a Utility Relocation where liability has been previously determined. In the event the Design-Builder performs design or physical work under a Work Order, the Design-Builder shall submit to the Department a definitive cost estimate.

6.2.3.4 Overrun of Estimated Cost

6.2.3.4.1 Department Responsible for Payment of Utility Work

After a Work Order has been executed, the Design-Builder shall maintain accurate up-to-date records of each Utility Relocation cost as the Utility Work progresses. On an actual cost Work Order, immediately after the records indicate that the reimbursable costs of the Utility Work will exceed the amount of funds agreed upon in the Work Order, the Design-Builder shall immediately notify the Department and the Utility Owner in writing. The notification shall include an estimate of the amount of additional funds necessary to complete the Utility Work, and the reason(s) the original amount will be exceeded. If Approved by the Department, an amended Work Order shall be executed by all parties.

Should the Design-Builder perform Utility Work that would qualify for the Department reimbursement, but for which the Department has not previously encumbered funds, that Utility Work shall be done at the Design-Builder's risk. In order to qualify for reimbursement for that Utility Work, the Design-Builder shall notify the Department and the Utility Owner in writing of the additional cost before performing the work. Notification shall include an estimate in the amount of additional funds necessary to cover the additional cost and the reasons why the current amount encumbered will be exceeded. Any payments for increases in the cost estimates shall be Approved in writing by the Department prior to the Design-Builder incurring such costs.

6.2.3.4.2 Utility Owner Responsible for Payment of Utility Work

When the Design-Builder performs work under a Work Order for which the owner is responsible for payment, the Design-Builder shall maintain accurate up-to-date records of each Utility Relocation cost as the Utility Work progresses. On an actual cost Work Order, when the records indicate that the reimbursable costs of the Utility Work will exceed the amount of funds encumbered, the Design-Builder shall immediately notify the Utility Owner and the Department in writing. The notification shall include an estimate of the amount of additional funds necessary to complete the Utility Work and the reason(s) the original encumbrance will be exceeded together with supporting documents.

The Utility Owner shall pay the Department the estimated Utility Relocation costs for each Utility Relocation Work as provided in the applicable Work Order, as adjusted for any increase/decrease in the actual costs of performing that Utility Work. Any increases in cost estimates shall be approved in writing by the Utility Owner prior to incurring additional costs.

6.2.3.5 Notifications

6.2.3.5.1 Coordination with Utility Owners

The Design-Builder shall notify the Utility Owners in accordance with the Notice to Owner in construction coordinating at least 48 hours before commencing any operations that affect a Utility, unless otherwise agreed to in a Utility Agreement.

6.2.4 Failure of Utility Owner to Cooperate

The Design-Builder shall make diligent efforts to obtain the cooperation of each Utility Owner as necessary for the Project. The Design-Builder shall notify the Department immediately if the Design-Builder becomes aware that a Utility Owner is not cooperating in providing needed work and/or Work approvals. After such notice, the Design-Builder shall continue to diligently pursue the Utility Owner's cooperation and assist the Department as requested with regard to the problem.

6.2.5 Standards

In the event of a conflict among the standards set forth in Book 3 relating to Utilities, the order of precedence shall be as set forth below, unless otherwise specified.

Utility Standards and Requirements

Priority	Agency	Title
1	Department	Standard Special Provisions
2	Department	Standard Specifications, May 2006
3	Department	Standard Plans, May 2006
4	Department	Project Development Procedures Manual
5	California	California Streets and Highways Code
6	Department	Ready to List (RTL) Construction Contract Award Guide
7	Department	Plans Preparation Manual
8	Department	CADD Users Manual
9	Department	Encroachment Permit Manual
10	Department	Chapter 13 of the RW Manual

6.3 Design Requirements

6.3.1 General

All design furnished by the Design-Builder and all reviews and approvals by the Design-Builder of design furnished by the Utility Owners shall be in full compliance with the requirements of the applicable Utility Agreements, , The Design-Builder shall be responsible for taking all actions necessary to verify that Relocation Plans, whether furnished by the Design-Builder or by the Utility Owner, and regardless of the type of design plans provided by the Utility Owners, are consistent and compatible with the Contract Document requirements, the Utility Agreements, the written standards of the respective Utility Owners, all applicable governmental rules, all Utility permits, and with the Design-Builder's design and construction of the Project. In case of conflicts, the most stringent standards or requirements will govern. The Design-Builder shall obtain information regarding the standard design plans the Utility Owners routinely use for their Utility Work.

6.3.3 Verification

The Design-Builder shall take all actions necessary to identify and confirm the existence and exact location, size, and type of all Utility facilities within the R/W or otherwise potentially impacted by the Project construction, whether or not such Utilities are shown in the Utility Plan sheets, and the Pothole Tables showing Potholing Information if applicable.

This shall include all potentially impacted Service Lines. Such actions shall include making diligent inquiry at the offices of the Utility Owners, consulting public records, and conducting field studies (such as potholing), taking into consideration the possibility that Utility Owners may provide inaccurate or inexact information with regard to their facilities. The Design-Builder shall notify the R/W Acquisition of any service connection that is impacted.

The Design-Builder shall prepare a Conflict Map for each Utility impacted by the Project, identifying the location of the existing Utility and the nature of the conflict. The information shown on the Conflict Map sheets shall include the following:

- Existing and proposed R/W;

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- Existing topography;
 - Proposed Project elements;
 - Existing Utilities

6.3.4 Design by Design-Builder

If the Design-Builder and the Utility Owner agree that the Design-Builder shall furnish the design of the Utility Work, the Design-Builder shall submit its design to the Utility Owner for review and approval for each Utility Relocation design. All subsequent changes to designs will require written Utility Owner approval. The Design-Builder shall also submit each design to the Department for its advance review and comment.

In each instance where the Design-Builder performs the design of the Utility Work concerning a Utility Owner's facilities, the Design-Builder shall be responsible for obtaining written specifications, current at the time of the Utility Work, from the Utility Owner and for verifying that they are consistent and compatible with the Design-Builder's overall Project design. The Utility Owner's written specifications will be included in the Work Order.

6.3.5 Design by Utility Owner

The Department shall obtain Utility Work Plans from the Utility Owner for all conflicts that the Utility Owner is responsible for designing.

The Design-Builder shall review these plans for compliance with the design requirements within the Contract Documents and provide comments to the Utility Owner as appropriate. As a minimum, the work plan information must meet the standard of quality necessary for the Utility Owner to construct the Utility Relocation. The Design-Builder shall provide all information necessary for the Utility Owners to create Relocation Plans, including, construction staking and survey information, profile and/or cross section information, and potholing for confirmation of conflicts and coordinates.

The Design-Builder shall confirm that the Owner's Relocation Plan has resolved the conflicts identified in the Conflict Map. The Design-Builder shall inform the Utility Owner in writing.

6.4 Construction Requirements

6.4.1 Construction by Design-Builder

In each instance where the Design-Builder performs the physical relocation, the Design-Builder shall be responsible for obtaining written standards and specifications, current at the time of the Utility Work, from the Utility Owner and for verifying that they are consistent and compatible with the Design-Builder's overall Project design. The Utility Owner's written standards and specifications will be included in the Work Order. The Design-Builder is also responsible for complying with the Utility Owner's written standards and specifications, the approved plans, all applicable governmental rules, Utility permits, and the requirements of the Contract Documents. In case of conflict, the most stringent standard or requirement will govern.

6.4.1.1 Inspection

Each Utility Owner, through its representative, will have the right to inspect the construction performed on its Utilities by the Design-Builder. The Design-Builder shall not unreasonably refuse such Utility Owner inspection requests and shall coordinate the schedule and scope of such inspections with the Utility Owner.

6.4.1.2 Approval

Design-Builder shall provide to the Department the Utility Owner's written approval of the Utility Work.

6.4.2 Construction by Utility Owner

The Design-Builder shall inspect all Utility Work performed by Utility Owners and/or their Subcontractors in order to verify compliance with requirements. The Design-Builder shall approve the construction performed by each Utility Owner in order to verify that the construction complies with the Contract Document requirements, the Utility Agreements, the approved plans for such construction, all applicable Governmental Rules, and Utility permits. In order to evidence its approval, the Design-Builder shall provide an approval letter to the Utility Owner with a copy to the Department. The Design-Builder shall immediately notify the Department in writing regarding any noncompliance.

6.4.3 Incidental Utility Work

Incidental Utility Work includes all of the following Utility Work necessary and/or convenient for the construction of the Project:

- Protection of existing Utilities
- Minor modification of existing facility

The Design-Builder shall be responsible for all Incidental Utility Work without regard to the allocation of responsibility for Utility Work. The Design-Builder shall make all arrangements and perform all Utility Work necessary in order to accomplish the Incidental Utility Work, including, but not limited to, locating existing Utilities, identifying conflicts, performing any necessary coordination with Utility Owners and property owners, furnishing design, performing construction, reimbursing Utility Owner Inspection costs, and obtaining and complying with all applicable legal requirements and required Governmental Approvals.

6.4.3.1 Protection of Existing Utilities

If the facility in conflict can be protected in place instead of relocation, the Design-Builder shall review the proposed protection and inform the Department, in writing, whether the proposal is approved or not.

6.4.3.2 Utility Removal Work

The Utility Removal Work consists of all Utility Work necessary to remove any abandoned utility for which leaving the existing Utility in place is not feasible or allowed, or which is required to be removed in order to accommodate or permit construction of the Project.

6.4.4 Abandon in Place

Any facility proposed to be abandoned in place shall be in compliance with ' Encroachment Policy, Section 600

6.4.7 Damage to Utilities by Design-Builder

In performing the Work, the Design-Builder shall require its Subcontractors, employees, and agents to exercise due precaution and care to avoid causing damage to the Utility Owner's facilities, persons, and property. The Design-Builder shall be responsible for any and all damage caused by the Design-Builder's Subcontractors, employees or agents to the property, facilities, structures, or persons of the Utility Owner. The Design-Builder shall immediately notify the affected Utility Owners of any Utilities damaged by the Design-Builder during the Design-Builder's performance of the Work. The Design-Builder shall be responsible for all costs and/or schedule impact associated with said damage.

Promptly after the Design-Builder's discovery of such damage or the Design-Builder's receipt of notice of any such damage from the Utility Owner or from any other source: (a) the Design-Builder shall repair the damage to the Utility Owner's satisfaction, or (b) at the Utility Owner's election, the Utility Owner may make such repairs at the Design-Builder's expense. If the Design-Builder fails to make any required payment to a Utility Owner 60 Days after receiving the Utility Owner's invoice, the Department may make such payment if required pursuant to the applicable MUA or otherwise at the Department's sole discretion. If the

Design-Builder's failure to pay is due to a reasonable dispute, then the Department may not make such payment until at least 60 Days after the final resolution of such dispute has occurred without payment by the Design-Builder. If the Department makes any payment, the Design-Builder shall reimburse the Department for such payment within 10 Days after receipt of the Department's invoice, or, in the Department's discretion, the Department may deduct the amount of reimbursement due from the next payment (or payments, if necessary) due to Design-Builder under the Contract.

6.5 Deliverables

Deliverables shall be submitted to the Department in hard copy and electronic versions.

- Department Utility Permit Application: The Design-Builder shall submit one original with two sketches to the Department for Approval on all Utilities that are designed by the Design-Builder. Submittal shall be within two Days of the Design-Builder's receipt of the Utility's Design Approval Letter. The Department will respond within 10 Working Days of receipt.
- Utility Tracking Report (blank form): One information copy of the Utility Tracking Report shall be submitted to the Department weekly or as otherwise directed by the Department. A preliminary Utility Tracking Report shall be submitted to the Department for Acceptance prior to NTP 2.
- Utility Design Sheet (UDS): The Design-Builder shall submit a copy to the Department and the Utility two Days before the initial Work Order meeting.
- Design approval letters: The Design-Builder shall submit a copy of each design approval letter to the Department as an exhibit to each Work Order.
- The Design-Builder shall submit a construction inspection approval letter to the Department within seven Days of Utility Work completion for each Utility Work Order.
- The Design-Builder shall submit a construction inspection approval letter to the Department within seven Days of Utility Work completion for each segment of work accomplished by a Utility Owner.

7 RIGHT OF WAY

7.1 General

The Department will acquire all rights of way (R/W), permanent or temporary, necessary for the Project in accordance with the *Right of Way Manual*. The R/W Maps (See RID) indicate the existing right of way (R/W) lines for the Project. The Department is not currently purchasing any additional R/W for the Project.

Design-Builder shall not enter into negotiations for purchase or lease of any property or property rights required to construct Project. Design-Builder, at its sole cost, may negotiate directly Permits to Enter private property for temporary use that would facilitate the design or construction of the Project, if it is determined by the Design-Builder, and agreed upon by the Department, that these properties would not otherwise be required but are for the sole benefit of the Design-Builder.

The Design-Builder has reviewed the existing right of way and understands schedule implications associated with the Department's acquisition of property rights. The Design Builder shall meet with the Department as soon as practicable to review the R/W requirements and provide input on the need for any additional R/W to facilitate the timely completion of Project. The Department will make reasonable attempt to accommodate the Design Builder's priority acquisitions.

Right of possession of the R/W (and upon contract acceptance the improvements made thereon by Design-Builder) shall remain at all times with the Department. Design-Builder's right to enter and use of the Site arises solely from permission granted by the Department under the Contract, and as directed.

The Department will provide the Design-Builder monthly status updates regarding the status of the acquisition process for parcels (if any) for which access has not been provided. The Department will provide written notification to the Design-Builder of the availability of each required parcel and notify the Design-Builder of any access restrictions that may be applicable. The Design-Builder shall not be allowed access to any parcel until said written notification is provided.

7.2 Administrative Requirements

The Design-Builder shall comply with those administrative requirements set forth in Section 7 that are applicable to Work performed by the Design-Builder.

7.2.1 Standards

If there is any conflict in standards, adhere to the standard with the highest priority. However, if the Design-Builder's Submittal has a higher standard than any of the listed standards, adhere to the Design-Builder Submittal standard.

If there is any ambiguity in standards, the Design-Builder shall obtain clarification in writing from the Department before proceeding with design or construction.

Use the most current version of each listed standard as of the Request for Proposal (RFP) issue date unless modified by Addendum or Change Order. In the event of a conflict among the standards set forth in Book 3 relating to R/W activities, the order of precedence shall be as set forth below, unless otherwise specified:

Right of Way Standards and Requirements

Priority	Agency	Title
1	Department	Right of Way Manual
2	FHWA	Uniform Relocation Assistance and Real Property Acquisition Policies Act 1970 as amended
3	Department	Surveys Manual
4	Department	Plans Preparation Manual
5	Department	CADD Users Manual
6	California	California Law (including, but not limited to, Government Code, Streets and Highways Code, and Business and Professions Code)
7	Department	Special Provisions
8	Department	Project Development Procedures Manual and Highway Design Manual
9	Department	2006 Revised New Standard Plans
10	Department	Standard Plans May 2006
11	Department	Design-Build Modifications to the Standard Specifications for Construction
12	Department	Standard Specifications
13	Department	Technical Memoranda

7.2.2 Meeting Requirements

Design-Builder shall:

- Conduct progress meetings with the Department, affected governmental persons, and other required groups, held monthly or as otherwise agreed upon by the Department and the Design-Builder
- Participate in meetings between the Department and affected property owners as requested
- Participate in condemnation meetings as requested.
- Conduct other meetings either identified within this section or requested by the Department, and in support of acquiring property rights.
- Prepare all necessary displays, agendas (sent to all participants one week prior to scheduled meetings), and meeting minutes (sent to the Department within five Working Days of the meeting).

7.2.3 Software Requirements

The Design-Builder shall prepare all electronic drawings in MicroStation and supporting electronic data in CaiCE with conversion to .PDF available. All reports and documents shall be prepared in Microsoft Word format.

7.3 Deliverables

7.3.1 R/W Requirement Maps

The Design-Builder shall submit a map showing R/W Requirements as described in Chapter 14, Section 2, Article 5 of the *Project Development Procedures Manual* if any of the following occurs:

- Any designated right of way line is moved or deleted.
- Any additional right of way is required.

7.3.2 Identification of Additional R/W

If the Design-Builder determines that additional R/W is necessary or required as a result of a Design Change or Construction Change Order, the Design-Builder shall prepare and submit a written request to the Department for consideration. This request shall identify the additional R/W sought, along with a justification for its need, and shall include drawings depicting proposed construction limits and cross-sections. The Department will review the request and will determine whether the acquisition is acceptable and within the scope of the Environmental Document:

The Department will notify the Design-Builder in writing regarding the schedule and processes required to complete the acquisition. Depending on parcel complexity, the Department may require up to 18 calendar months from the date the right of way requirements are received from Design-Builder to certify the parcel(s) for access. Schedule implications shall be incorporated into the Design-Builder's schedule and the Department shall not be responsible for any construction delays resulting from the acquisition and clearance of such Additional R/W. Access to the Additional R/W will not be allowed until the Department has notified the Design-Builder in writing that it is available for use.

7.3.3 Certificate of Sufficiency / Hazardous Material Disclosure Document

The Department will provide R/W Appraisal Maps for each additional parcel to be acquired. Design-Builder shall verify that the designated R/W lines are sufficient to construct the project by completing the Certificate of Sufficiency (CoS) (Form to be provided by Department) and returning to the Department.

7.3.4 Final Monumentation

The Department shall monument the final right of way in accordance with the Business and Professions Code and the Department policy. The Design-Builder shall notify the Department when the locations to be monumented are prepared in accordance with *Standard Plans* (A85 "Chain Link Fence" and A86 "Barbed Wire and Wire Mesh Fences"). The cost of any re-monumenting necessitated by the Design-Builder's operations subsequent to said monumentation shall be deducted from the most current partial payment due the Design-Builder.

7.4 Acquisition Activities

The Department will be responsible for payments to all property owners, except as directed elsewhere in this Section 7. All costs of the Design-Builder's activities in support of R/W Work shall be included in the Design-Builder's Proposal

7.4.1 Early Access

Where early access (rights of entry, permits for testing, or similar permissions) are requested by the Design-Builder for any additional property intended to be used temporarily or permanently, the Design-Builder may request in writing, that R/W negotiate with property owners or occupants for early access provided there is no violation of law. Early access will not be permitted for parcels within the planned R/W limits. The Design-Builder shall in no event use its own forces to negotiate for early access within the Project limits whereas any violations of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, as amended may jeopardize Project funding. The Design-Builder may use its own forces to negotiate any Temporary rights or permission to use properties outside the proposed Project right of way for its purposes to complete the Project construction. In the event that the Design-Builder's

request for early access is approved in writing by R/W, such activities will be subject to the provision that R/W may withdraw from such activities at any time solely under its own discretion.

7.4.2 Relocations

The Design-Builder shall not interfere with the Department in the relocation of any occupants from any property within the planned R/W limits or from any additional property that the Department agrees to acquire, to avoid any negative impacts to project during relocation. The Design-Builder shall not undertake any activities that are not in accordance with applicable State of California and Federal Law (including the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, as amended). Any and all appeals for relocation Assistance shall be heard by the Department in compliance with Departmental policy and procedures and in compliance with guidelines set forth by the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, as amended.

7.4.3 Eminent Domain – Condemnation

The Design-Builder shall provide support for eminent domain acquisition activities, if necessary, including but not limited to depositions, testifying in court, and preparation of exhibits.

7.4.4 Property Management

The Design-Builder is responsible for management of all Project R/W and improvements at the time the Department acquires the R/W and gives written notice to the Design-Builder after Contract award. Design-Builder shall remove all buildings, including foundation removal for all buildings and structures on the Project R/W.

If the Design-Builder deems appropriate and with the Department Approval, the Design-Builder may sell buildings in compliance with the procedures set forth in the *Right of Way Manual*. All building sales must be performed by a California licensed real estate agent. The Design-Builder shall process the equipment exhibit. The Design-Builder shall submit the check out form to the Department for review. Prior to the sale of the building, Design-Builder shall perform the following:

- Secure the building against unauthorized entry.
- Drain the pipes and water heater, if appropriate, and put antifreeze solution in the fixtures.
- Disconnect water, gas, and electric services and have the meters removed. Bills for Utilities properly payable by the Department, covering the period after the keys are turned over to the Design-Builder, should be forwarded to the Department for payment.
- Submit Notice of Vacancy and Utility Shut-Off forms to the Department when the building is vacant and retain keys for the building.
- Notify in writing police and fire department of vacant buildings.
- Place “For Sale” signs on the building (as supplied by the Department) upon being notified of pending offering by the Department.
- Open the building for inspection by prospective bidders on predetermined dates.

After the building is sold, the Design-Builder shall perform the following items:

- Check the building removal progress and Site clean up. Photograph, as necessary, to provide documentation of noncompliance and unfinished Work.
- Check temporary fencing around open basement (if applicable).
- Coordinate basement filling, if applicable, with the Department.

8 [NOT USED]

9 LAND SURVEYING

9.1 General

The Design-Builder shall perform all work necessary to meet the requirements associated with land surveying, including project, and supplemental horizontal and vertical control surveys, subsequent mapping and topographic surveys, bridge-site surveys, utility surveys, soils surveys, construction surveys, as-built surveys, and all other land surveying services necessary to complete the project in an accurate, neat, and timely fashion. When the Department Standards exist for survey activities, such surveying shall be done in accordance with the Department Standards. This work shall not include primary horizontal and vertical control surveys, right way engineering, right-of-way surveys, and all land surveying associated with right-of-way engineering close-out activities and right-of-way monumentation.

The Department will perform primary horizontal and vertical control surveys, right-of-way surveys, right-of-way engineering including close-out activities, and right-of-way monumentation required in support of the work.

9.2 Administrative Requirements

9.2.1 Laws, Standards, and Specifications

All of the land surveying work performed by the Design-Builder shall be conducted in accordance with the requirements of California Statutes and the standards and specifications listed below. Note: the standards and specifications below are listed by order of priority. Also, the most current version of each shall be used unless modified by an Addendum or Change Order.

If there is any ambiguity in the laws, standards or specifications, the Design-Builder shall seek clarification from the Department before doing the work.

In the event of a conflict among the standards set forth in Book 3 relating to land surveying, the order of precedence shall be as set forth below, unless otherwise specified:

Priority	Entity	Title
1	State	All California Law
2	Department	Surveys Manual
3	Department	Standard Specifications
4	Department	Standard Plans
5	Department	Safety Manual
6	Department	Plans Preparation Manual and the CADD Users Manual
7	Federal Geographic	Geospatial Positioning Accuracy Standards, Part 3.Data Committee (FGDC) National Standards for Spatial Data Accuracy

9.2.2 Quality Management Plan

The Design-Builder shall develop a Quality Management Plan (QMP) that includes the complete description of the quality control (QC) and quality assurance (QA) activities for each surveying product.

The QMP shall be written to achieve the following:

- All individuals responsible for land surveying know what constitutes quality survey products.

- All individuals responsible understand the specifications, standards, and legal requirements for the survey products.
- To have a clearly defined QC plan and QA plan for each survey product.

The Department will perform an Independent Quality Assurance (IQA) of the QMP as well as for the resultant survey products.

9.2.3 Meetings

The Department and the Design-Builder shall meet at the request of one of the parties, as necessary, to discuss and resolve any questions or problems related to the land surveying work for this project. The requesting party shall provide the other party not less than five (5) working days notice of such meetings.

9.2.4 Survey Data Provided to the Design-Builder

The Design-Builder shall verify and confirm the location, accuracy, and datum of all land surveying data provided to the Design-Builder, regardless of the source of the information. The Design-Builder shall document all forms of data verification. If the Design-Builder identifies any discrepancy, the discrepancy shall be reported in writing to the Department for review. The Department will respond to the discrepancy within 10 business days.

9.2.5 Survey Coordination and Qualifications

The Design-Builder shall designate a Survey Manager for the Project. The Survey Manager shall possess either a valid California Professional Land Surveyor license, or a valid California Registered Civil Engineer license issued prior to January 1, 1982. The Survey Manager will manage all Design-Builder survey activities associated with the Project and shall be responsible for directing and reviewing all Design-Builder and Subcontractor survey work and be the point of contact for all survey activities. The Survey Manager shall be in responsible charge of each land surveying activity, or designate a licensed Land Surveyor or a pre 1982 licensed Civil Engineer to be in responsible charge of specific land surveying tasks.

The Design-Builder's Survey Manager shall be available for regular, periodic technical meetings with the Department survey staff in association with the land surveying tasks required for this project. The Survey Manager shall be available to be on-site during design and construction activities. All land surveying required, as part of the project shall be in full compliance with all State and local laws. The Survey Manager shall have a thorough knowledge and understanding of all aspects of the standards and specifications identified in Section 9.2.1 above.

9.2.6 Department Supplied Information

The Department will provide all Department land surveying data relevant to the project which may include, but not limited to, the following items:

- The location and coordinate values of the available horizontal and vertical control stations within the Project.
- Existing centerline roadway alignments.
- Engineering survey data.
- Photogrammetric mapping.
- Right of Way mapping.
- Land net retracement mapping.
- As-Built utility location information.

9.2.7 Safety Requirements

The Survey Manager and all staff performing land surveying tasks for this project shall have a thorough knowledge and understanding of all of the relevant safety practices and procedures as outlined in the Department Safety Manual and the Department Surveys Manual. The Design-Builder's land surveying staff shall be properly outfitted with the necessary safety equipment to perform any surveying as part of this project.

9.3 Design Requirements

9.3.1 Survey Control Requirements

9.3.1.1 Survey Control Adjustments and Accuracy

The Design-Builder shall document the use of present survey control networks and the establishment of any subsequent survey control networks that will be used in conjunction with the Project. These records shall include survey control monument locations, types, accuracy values, adjustment results, and establishment methods.

The accuracy standard for any subsequent control networks established by the Design-Builder shall be in conformance with Chapter 5 and Figure 5-1 of the Department Surveys Manual and all other specifications described in the Department Surveys Manual.

9.3.1.2 Survey Control Datum

The horizontal survey datum used for the Project shall be the California Coordinate System of 1983 (CCS83) as described in the Public Resources Code, Sections 8801 et. seq., and using the zone and epoch designated by the Department.

The vertical survey datum shall be the California Orthometric Heights of 1988 (COH88) as described in the Public Resources Code, Section 8890 et. seq..

9.3.2 Preservation of Survey Monuments

9.3.2.1 Public and Private Land Survey Monuments

The Design-Builder shall locate and preserve all previously established survey monuments located within the Project in accordance with Section 8771 of the Business and Professions Code.

9.3.3 Prepare Base Maps and Plan Sheets

The Design-Builder shall conduct all tasks necessary to complete all mapping for the Project. This shall include all planimetric, topographic, design, utility, centerline alignment, and base maps necessary to complete the Project.

9.3.3.1 Project Concept Review (30% Construction Review)

9.3.3.2 Surveys and Photogrammetric Mapping for Design

This shall include location surveys as described below. This list is not intended to be all-inclusive, but rather to cover design surveys commonly encountered.

9.3.3.3 Photogrammetric Maps and Products

Photogrammetric maps and products shall conform to the specifications within Chapter 13: Photogrammetry of the Department Surveys Manual.

9.3.3.4 Engineering Surveys

Engineering survey maps and products shall conform to the specifications within Chapter 11: Engineering Surveys of the Department Surveys Manual.

9.3.4 Survey Records and Reports

The Design-Builder shall maintain neat, accurate, and complete documentation for all land survey work performed for this project. These records shall include all calculations, mapping, staking notes, and field crew daily diaries. The Design-Builder shall prepare a formal survey report for all survey calculations related to survey control networks, design surveys, and construction surveys. The intent of each report is to document and perpetuate the information and rationale used to perform the land surveying task.

9.4 Construction Requirements

9.4.1 Construction Surveys

The Design-Builder shall perform all construction surveying necessary to facilitate all construction operations for the duration of the Project and shall conform to the specifications within Chapter 12: Construction Surveys of the Department () Surveys Manual.

9.5 Deliverables

9.5.1 General Requirements

The Design-Builder shall index and submit all calculations, notes, computer files, raw data, project reports, meeting notes, correspondence, digital images, maps, corner records, records of survey, aerial photogrammetric products, centerline alignment maps, and other maps and related items as part of the work.

Deliverables shall be submitted in both hardcopy where appropriate (i.e. electronic measurement raw data should only be provided in electronic format) and electronic formats at the completion of each activity. Electronic data submitted shall be compatible with the Department software and operating systems. Mapping shall conform to the Department Plans Preparation Manual and the Department CADD Users Manual. GIS deliverables shall adhere to the FGDC Geospatial Positioning Accuracy Standards and the National Spatial Data Infrastructure (NSDI) requirements.

Photogrammetric products shall conform to the specifications within Chapter 13: Photogrammetry of the Department Surveys Manual.

Final acceptance for the survey portion of the Work will not be given until all deliverables have been submitted and approved by the Department. The Department will have 10 calendar days to complete its compliance review of the Design-Builder's submitted project deliverables.

9.5.2 Survey Records

Survey records shall be delivered in both hardcopy where appropriate (i.e. electronic measurement raw data should only be provided in electronic format) and electronic file format. They shall be delivered at the time of substantial completion unless requested by the Department at an earlier time.

9.5.3 Survey Reports

Each survey report shall be submitted to the Department within 30 Calendar Days of the completion of each survey regardless of the type of survey performed.

The report shall be in a hardcopy format and also in electronic file format when possible. The reports shall include information related to the source data used, the calculations performed, and the data produced as part of the survey process. The Department will provide the format specifications of each report type. Each report shall be reviewed and signed by a California

Professional Land Surveyor, or California Registered Civil Engineer licensed prior to January 1, 1982.

9.5.4 As-Builts

The Design-Builder shall produce reports documenting the location of the as-built alignments, profiles, structure locations, and utilities. These reports shall include descriptive statements for any survey methods used to determine the as-built location of the feature being surveyed. The Design-Builder's as-built data shall include the coordinate types (x , y , and/or z) and feature codes in the same format that the preliminary construction data was generated in. Where data has been provided to the Design-Builder from the Department in an x , y only coordinate format, or z only coordinate format, the Design-Builder shall provide the Department with data in an x , y only coordinate format, or z only coordinate format.

9.5.4.1 Survey Base Map

The Design-Builder shall provide to the Department an as-built survey base map file in MicroStation format (.DGN). This file will include:

- Utilities – Structures and related items above and below the ground that are part of the power, water, sewer (storm and sanitary), natural gas, telephone, communications, and pipeline systems within the Project.
- Alignment – The location of the in-place roadway and railroad alignment within the Project.
- Survey Control – The location and coordinate values of available horizontal and vertical control stations within the Project.

The Design-Builder shall provide an XML file written in schema 1.0 containing coordinate geometry and feature code information for the above mentioned utilities, property information, centerline alignments, and survey control items.

The Design-Builder shall provide an XML file written in schema 1.0 consisting of the as-built storm sewer system.

All as-built survey files shall be delivered within 30 working days of Substantial Completion of the Project.

10 EARTHWORK

10.1 General

The Design-Builder shall conduct all Work necessary to meet the requirements of earthwork, including clearing and grubbing; excavation and embankment; removal of pavement, pavement markings, and miscellaneous structures; sub grade preparation and stabilization; dust control; aggregate surfacing; and earth shouldering in accordance with the requirements of this Section 10 and the below standards.

10.2 Administrative Requirements

10.2.1 Standards

In the event of a conflict among the standards set forth in Book 3 relating to grading, the order of precedence shall be as set forth below, unless otherwise specified:

<i>Priority</i>	<i>Author or Agency</i>	<i>Title</i>
1	Department	Standard Special Provisions
2	Department	Standard Specifications
3	Department	Standard Plans
4	Department	Technical Memoranda
5	Department	Geotechnical and Pavement Manual
6	Department	Asbestos and Regulated Waste Manual for Structure Demolition or Relocations for Construction Projects
7	Department	Construction Manual

10.2.2 References

Use the references listed below as supplementary guidelines for the grading analysis and design. These publications have no established order of precedence.

Grading Publication References

Agency	Title
Department	Construction Procedures Directives
Department	Construction Policy Bulletins
Department	Standard Test Methods – Volumes 1, 2 & 3

10.3 Design Requirements

See Standards.

10.4 Construction Requirements

The Design-Builder shall remove all existing roadway pavement as required in the Project. The removal of roadway pavement shall include PCC and AC surfacing, aggregate base and subbase, cement treated base, soil, rock, concrete curb and gutter, concrete sidewalk, AC dikes, and other obstructions within the Project limits necessary to construct the Project. When removing such items, or where a portion of the existing surfacing is to be removed, the outline of the area to be removed shall be cut on a neat line with a power-driven saw to a minimum depth of 0.17-foot before removing the surfacing.

10.4.1 Building Removals

The Design-Builder shall remove all existing buildings located within the new Right of Way limits. The Design-Builder shall remove and dispose of all objects encountered on the building removal parcels not otherwise designated for salvage or reuse, including pavements, sidewalks, minor structures and obstructions, fencing, pipes, culverts and underground tanks.

10.4.2 Removal of Miscellaneous Objects

The Design-Builder shall remove and properly dispose of all objects encountered within the R/W that are not otherwise designated for removal, salvage, or reuse, such as abandoned automobiles, furniture, appliances, garbage, and other waste materials.

10.4.3 Disposal of Materials

Disposal of surplus excavated material on Department R/W may be allowed on a case-by-case basis. The Design-Builder shall develop, implement, and maintain a Disposal Site Plan showing grading and restoration of any such areas.

Topsoil shall not be removed from the Site. If excess topsoil is available, the Department will direct the Design-Builder where to stockpile the material within the Department's R/W.

10.4.4 Mining

Mining of material within the Department R/W will not be allowed without prior the Department Approval. To request the Department Approval, the Design-Builder must develop, implement, and maintain a Mining Plan addressing site restoration, environmental impacts, material management, and other pertinent information.

10.5 Deliverables

10.5.1 Mining Plan

If the Design-Builder intends to perform any mining within the Department R/W, the Design-Builder shall submit a Mining Plan to the Department for Approval and must receive the Department Approval before mining any material within the Department R/W. The Department will respond within 10 Working Days of receipt of the plan.

10.5.2 Disposal Site Plan

If the Design-Builder proposes to dispose of surplus excavated material on the Department R/W, the Design-Builder shall submit a Disposal Site Plan to the Department for Approval and receive the Department Approval before disposing any material. The Department will respond within 10 Working Days of receipt of the plan.

The Design Builder must submit the approved "Solid Waste Disposal and Recycling Reports" to the Department no later than February 1st of each year or within 15 days after receiving the final report. Contact information for the Department and statewide recycling coordinators is available via the following Internet address:

<http://www.dot.ca.gov/hq/oppd/ab75/coordinators.htm>

10.5.3 Borrow Site Plan

If borrow material is required for the Project, the Design-Builder shall submit a Borrow Site Plan to the Department for Approval and must receive the Department Approval before using the site. The Department will respond within 10 Working Days of receipt of the plan.

11 ROADWAYS

11.1 General

The Design-Builder shall conduct all Work necessary to meet the requirements of roadways. Roadway classifications include mainline, acceleration lanes, deceleration lanes, auxiliary lanes, collector/distributor roads, truck/climbing lanes, ramps.

11.2 Administrative Requirements

11.2.1 Standards

The Design-Builder shall perform Roadway Work in accordance with the relevant requirements of the standards listed below.

If there is any conflict in standards, the order of precedence shall be as set forth below, unless otherwise specified. However, if the Design-Builder's Submittal has a higher standard, then adhere to the Submittal standard.

If there is any unresolved ambiguity in standards, it is the Design-Builder's responsibility to obtain clarification from the Department before proceeding with design and/or construction.

Use the most current version of each listed standard as of the initial publication date of this RFP unless modified by Addendum or Change Order.

Roadway Standards		
Priority	Agency	Title
1	Department	Highway Design Manual (HDM)
2	AASHTO	Policy on Geometric Design of Highway and Streets
3	Department	Standard Special Provisions
4	Department	Standard Specifications
5	TRB	Highway Capacity manual
6	AASHTO	Roadside Design Guide
7	Department	Project Development Procedure Manual
8	Various Agencies	Technical Memoranda
9	Department	Standard Plans

11.2.2 References

- Use the references listed below as supplementary guidelines for the design of the roadway and/or freeway system. These publications have no established order of precedence.

Roadway References

Agency	Title
Department	Plans Preparation Manual
Department	Drafting and Plans Manual and the Caltrans CADD Users Manual
Department	Final EIR/EIS
NCHRP	Report 350-Recommended Procedures for the Safety Performance Evaluation of Highway Features
Department	Ready to List and Construction Contract Award Guide (RTL Guide)

11.2.3 Local Road System

The Design-Builder shall meet local road criteria provided by the local governing agencies.

11.2.4 Preliminary Engineering Plans

- The Preliminary Engineering plans in the Reference Information Documents show only a preliminary design for the Project. These drawings and the supporting electronic files are included to illustrate the general scope of improvements. Verify all information prior to use.
- The Design Builder shall have the flexibility to make Project changes without impairing the essential functions and characteristics of the Project, such as safety, traffic operations, durability, desired appearance, maintainability, environmental protection, drainage, and other permitted constraints.

11.2.5 Software

The Design-Builder shall prepare drawings in Micro Station and CAiCE by Auto Desk on the same version in use by Caltrans on the date of the Final RFP.

The Design-Builder shall use Auto Turn by Tran soft Solutions.

11.2.6 Meetings

Department and the Design Builder shall meet at the request of one of the parties, as necessary, to discuss and resolve matters relating to Roadway Work during the design and construction stages. The requesting party shall provide the other parties with not less than five (5) days prior notice of such meetings. The Design Builder shall prepare and distribute a record of the minutes to the meeting within five (5) days.

11.3 Design Requirements

11.3.1 Design Standards

The Design Builder shall design and construct all roadways to comply with the following performance requirements:

- Meet all Department and AASHTO roadway design and safety standards;
- Meet capacity for the specified design year;
- Meet all future improvements identified as the “preferred alternative” in the environmental document.
- Meet the widths of all cross streets as shown in the Preliminary Engineering Documents.

The scope of improvements shown in the Preliminary Engineering Documents reflects the preferred alternative described in the Final environmental report. This preliminary design was used to establish the right of way limits. The Design Builder shall acquire additional right of way, provide environmental clearance, and obtain Department approval for any design changes that extend beyond the right of way limits or exceed the impacts of the preferred alternative.

The Design Builder shall design and construct all roadway elements according to Department and AASHTO standards. This includes but is not limited to horizontal alignment, vertical alignment, super-elevation, cross slopes, lane widths, shoulder widths, medians, clear zone, side slopes, and

cut and fill slopes. This Project has additional specific requirements for some of these elements, which are given in this section-

The Design Builder shall identify and correct all clear zone deficiencies on the freeway facility for all areas adjacent to new construction.

The Design Builder shall design all temporary roadway facilities to comply with the same design and construction requirements as that of the permanent roadway facilities. Design-Builder shall furnish all necessary design documents and obtain all necessary permits for temporary traffic detours, temporary realignments of existing local roadways, and access roads affected by Project construction. Design Builder shall coordinate the design of these elements with Department and affected local agencies.

The Design Builder shall prepare all necessary engineering studies and applicable design reports to justify all project roadway elements used in the project.

The Design Builder shall determine the construction limits of all improvements required on all roadways and include said limits in the design documents.

The Design Builder shall obtain approval from Department prior to constructing any temporary entrance/exit ramps and perform any associated engineering, documentation, and coordination.

The design vehicle type for all turning movements and acceleration/deceleration lengths for the mainline, ramps, arterials, and other roadways associated with the Project is the STAA or bus, whichever vehicle governs a particular roadway element. For vertical curves and sight distance applications, the design vehicle is a passenger car

The Preliminary Engineering Plans show typical sections for mainline and cross streets. These include the number of lanes, shoulders, medians, curb and gutter, sidewalks, and other cross section elements. The number and location of lanes in each direction on mainline including the auxiliary lanes shall be consistent with the Preliminary Engineering Plans. The Design Builder shall extend the full depth pavement section for the entire width of all shoulders. The pavement includes the roadway pavement; the access ramps from and to the interchanges; incidental shoulder paving, such as MVPs and maintenance roads; and all required improvements to local streets and relocated streets.

The Design-Builder shall follow the Project-specific design standards for specific roadways shown in the following tables.

PROJECT-SPECIFIC DESIGN STANDARDS

Roadway: Mad-99 Mainline Construction
Location: City of Madera From PM 9.50 to PM 13.1

Design Standards	Freeway Mainline
Jurisdictional System	Department
Functional Class	Freeway
Access Control	Full
Highway Type	Multi-Lane Divided, Urban Section
Design Vehicle	STAA
Terrain	rolling

Traffic Volumes AA DT Year 2010	73,000 (SEE DESIGN DESIGNATION)
Traffic Volumes Projected AA DT Year 2050	108,500 (SEE DESIGN DESIGNATION)
Projected Posted Speed	65 mph
Proposed Design Speed	75 mph
Shoulder Bus Use	No
Median Type	Pave median with Concrete Median Barrier
Special Features:	
1. There are three pump house and drainage Vault under the Freeway within the Project limits. The Locations are at PM. 10.29, PM 11.12 and PM 12.12. The depth of the pavement with this locations is about 1'0.	
2. Lane 2 (truck lane) and out side shoulder shall be built with Continuously Re-enforced Concrete pavement PM 10.00 to 11.60 both NB and SB. Median shall be built with Jointed Plain Concrete Pavement from PM 9.5 to 11.6 both NB and SB.	
3. Lane 1 shall be built with Jointed Plain Concrete Pavement from PM 9.5 to 11.6 both NB and SB.	

11.3.1.1 Slopes

All grading slopes shall be 1:4 (V:H) or flatter and slope.

11.3.1.2 Traffic Barrier

The Design Builder shall submit a detailed design justification and design calculations for all traffic barrier installations. This shall accompany any Released for Construction Documents involving Roadway grading or traffic barrier. All railings and barriers shall be constructed in conformance with the provisions in the Department (*Caltrans*)*Standard Specifications* and the Department *Standard Plans*.

The Design Builder shall use galvanized steel posts and notched recycled plastic blocks for all plate beam guardrail installations unless otherwise Approved by Department. Any guardrail installations that have not been crash tested using steel posts, such as Thrie-Beam Bullnoses, shall be constructed using wood posts in accordance with *NCHRP Report 350 – Recommended Procedures for the Safety Performance Evaluation of Highway Features*.

The Design Builder shall design and construct all guardrail terminals to avoid vaulting. Refer to the *Roadside Design Guide* and the *Standard Plans* for appropriate safety devices.

The Design Builder shall meet the requirements for the use of concrete traffic barrier set forth in the project Visual Quality requirements section in these technical provisions.

11.3.1.3 Fencing

Design-Builder shall comply with the *Highway Design Manual*, Department *Standard Plans* and Department *Standard Specifications* to meet fencing Work requirements.

11.3.1.4 [NOT USED]

11.3.1.5 Clearing and Grubbing

Clearing and grubbing Work may not start without an Approved SWPPP and a Traffic Management Plan (TMP). Refer to Drainage section and Maintenance of Traffic section, respectively, in these Technical Provisions.

11.3.1.6 Early Start of Rough Grading

In order for the Design Builder to proceed with the rough grading of a portion of the Project, Department shall have previously released for construction specific pertinent items of the design. These items include, but not limited to, the information described below

- Horizontal and vertical alignment
- Typical sections
- Related elements of the drainage system
- Related elements of the Final RMP. Refer to Drainage section of these technical provisions.
- Subsurface geotechnical explorations and recommendations
- Slope stability analysis and recommendations
- Preliminary structure general plan (if a structure is within the element or portion of the nonstructural work)
- Settlement monitoring program
- Construction specifications (for fills)
- Environmental clearance
- Traffic Management Plan (TMP)

11.3.2 Design Exceptions

Department has approved various design exceptions, which are included in Exhibit 11-A Fact Sheet Exceptions to Mandatory Design Standards. These design exceptions apply only at the locations specified in the design exception forms. The Design Builder shall meet or exceed all mitigation commitments listed in the forms. Department discourages creating additional exceptions and increasing the magnitude of the existing approved exceptions, and will not consider exceptions for modest benefits.

Department may consider further exceptions from standards or criteria on a case-by-case basis, at specific locations where the Design-Builder demonstrates that substantial benefit to Department and the public would accrue from the recommendation. Obtain Department approval of any such changes to the design standards or criteria. Fully and clearly document any changes from the Department design standards and criteria and maintain a complete record of all such changes for Department reference

11.3.3.1 Mandatory Design Exceptions

Mandatory standards use the word “shall” and are printed in bold face type in the HDM.

The Design Builder shall design all the elements associated with mainline highway and other roadways in accordance with the criteria established in the Contract Documents. Some elements of the design developed in the preliminary design may not meet these design requirements. For these variances, mandatory design exceptions have already been approved by Department and FHWA and are described below. The Design Builder shall submit the final mandatory design exceptions for Approval by Department and the FHWA.

The Design Builder is discouraged from creating additional mandatory design exceptions, since there is no assurance that they will be approved by Department or FHWA; however, elimination of existing design exceptions by the Design Builder is encouraged. If the Design Builder's design creates additional design exceptions, the Design Builder must demonstrate on a case-by-case basis that substantial benefits to the Project and the public would result from the Design Builder's recommendation. Any additional exceptions requested by the Design Builder will be subject to Department and FHWA Approval. The Design Builder shall comply with the Design Exception Process as stated in Chapter 21 of the Project Development Procedures Manual (PDPM)

Upon receipt of the design exception request, the request will be submitted to the Department's Geometric Reviewer for their review and approval. Geometricians will be available on the third week of each month. Once approved by the Geometricians, Department will forward the exception request to FHWA for Approval on the 13 controlling criteria if required (See Index 108.3 of the Highway Design Manual). This process could take approximately three (3) to six (6) months.

Exhibit 11-A Fact Sheet Exceptions to Mandatory Design Standards details the specific locations and minimum design parameters of the exceptions that have been approved. The Design Builder shall strive to enhance the geometric features of the Project and eliminate or minimize these design exceptions. The Design Builder should be cautioned that merely eliminating design exceptions without regard to the impacts to the overall design may not be considered an enhancement or benefit to the project. Each improvement to these design exceptions, when taken as a whole, shall provide an overall benefit to the traveling public over the existing or proposed conditions. The following Mandatory Design Exceptions has been approved:

Design Exception #1 – Vertical Clearance for Elevated Structures.

11.3.3.2 Advisory Design Exceptions

Advisory standards use the word "should" and are indicated by Underlining in the HDM.

The Design Builder shall design all the elements associated with mainline highway and other roadways in accordance with the criteria established in the Contract Documents

The Design Builder is discouraged from creating advisory design exceptions, since there is no assurance that they will be approved by Department; however, elimination of existing design exceptions by the Design Builder is encouraged. If the Design Builder's design creates design exceptions, the Design Builder must demonstrate on a case-by-case basis that substantial benefits to the Project and the public would result from the Design Builder's recommendation. Any exceptions requested by the Design Builder will be subject to Department approval. The format and requirements of the Advisory Design Exceptions shall follow the format and requirements of the Mandatory Design Exceptions as stated in Chapter 21 of the Project Development Procedures Manual (PDPM) with the exception that the Advisory Design Exceptions only need Department's District Approval. The Geometrician and FHWA approval are not necessary for an Advisory Design Exception.

Upon receipt of the design exception request, Department will review and if deemed acceptable, approve the request.

This process could take approximately two (2) to four (4) months.

11.4 Construction Requirements

Construction shall be in accordance with the requirements of the Standard Specifications and the Special Provisions.

The construction shall be QA inspection and testing plans.

11.5 Deliverables

11.5.1 Released for Construction Documents (RFC)

The Design-Builder shall produce plans and specifications in a format that facilitates design review by the Department. Refer to the Caltrans CADD User Manual, Plans Preparation Manual, and the Design Quality Management Plan, for required information on Released for Construction documents.

These RFC documents, and any subsequent revisions, shall be signed and sealed by a California licensed Professional Engineer and submitted to the Department for concurrence. The Department will respond to the submittals within 5 working days. The approved RFC documents must be distributed to all stakeholders at least 2 working days prior any construction activities relating to these documents.

11.5.2 Reports/Project Documentation

The Design-Builder shall provide the Department with a Roadways Design Report signed by a California-licensed Professional Engineer, which shall be a record set of all roadway design computations, all supporting data and parameters, correspondences, and meeting minutes regarding roadway issues.

The Design-Builder shall prepare bound reports and Project documentation in hardcopy and electronic format, organized by design topic, and delivered to the Department prior to Final Acceptance.

The following list of RFC plans, which is not an all inclusive list, shall be produced:

- Title sheet
- General layout sheets
- List of standard plans
- Earthwork tabulation and summary
- Typical sections
- Alignment plan
- Roadway/intersection plans
- Roadway profiles
- Construction Detail Plan
- Drainage Plans, Profile and Details
- Utility Plans
- Stage Construction and Traffic Handling Plan
- Detour Plans
- Construction Area Signs Plan
- Pavement Delineation Plans

-
- Signals, Lighting and Electrical Systems Plan
 - Roadway cross-sections
 - Specifications and special provisions

11.5.3 As-Built Documents

Upon completion of the Project, the Design-Builder shall deliver a complete set of As-Built Documents and design files that incorporate all design changes and details of Accepted Work that occurred throughout the Project. The As-Built Documents shall be signed by a licensed California Professional Engineer and be provided in both electronic and hardcopy formats. The as-built plans shall meet the format and content in accordance with the *Caltrans Plans Preparation Manual*.

The As-Built Documents shall include:

- Plans
- Shop drawings
- Design calculations [when requested by Department]
- Reports/Project documentation
- Specifications and Special Provisions

11.5.3.1 Cross-Sections

- Show: existing and proposed Utilities; existing and proposed R/W and easements
- Provide: 1-inch grid

11.5.3.2 Design Calculations

Design calculations shall include, but not limited to, the information described below:

- Horizontal sight distance (Intersections, all Roads, and mainline)
- Vertical sight distance: stopping, decision sight distance, and passing (if applicable) for all Roads
- Intersection geometrics (vehicle turning movements)
- Clear zones
- Superelevation
- Traffic barrier, end treatments, and impact attenuators
- Retaining Wall
- Sound Wall
- Earthwork
- Structures

11.5.3.3 Design Justification

Upon request by Department, the Design-Builder shall submit design justifications wherever the Contract Documents require that the “Design-Builder shall consider” various factors or alternatives. Documentation may be computer generated or hand written, though hardcopies and electronic versions shall be submitted. Design justifications shall clearly identify the following:

- Design issue
- Items requiring consideration

- Basis for evaluation
- Final decision and justification

11.5.3.4 Non-Standard Specifications and Special Provisions

If the Design-Builder requests Department's Approval to utilize methods or materials that are not Department standards, such request shall include comprehensive specifications and provisions associated with the proposed non-standard methods or materials.

EXHIBIT 11-A

Fact Sheet Exceptions to Mandatory Design Standards

All exhibits are provided as electronic files.

12 DRAINAGE

12.1 General

The Design-BUILDER shall conduct all Work necessary to meet the requirements associated with drainage, including culverts, bridge hydraulics, roadway ditches, permanent and temporary stormwater management systems, structural pollution control devices, retention/detention facilities (ponds), and closed storm drain systems.

12.2 Administrative Requirements

12.2.1 Standards

Design and construct the drainage systems in accordance with the relevant requirements of the standards listed by priority below.

If there is any conflict in standards, adhere to the standard with the highest priority. However, if the Design-BUILDER's Submittal has a higher standard than any of the listed standards, adhere to the Submittal Proposal standard.

If there is any unresolved ambiguity in standards, it is the Design-BUILDER's responsibility to obtain clarification from the Department before proceeding with design and/or construction.

Use the most current version of each listed standard as of the initial publication date of this RFP unless modified by addendum or change order.

Drainage Standards

Priority	Agency	Title
1	Department	Highway Design Manual
2	Department	Standard Special Provisions
3	Department	Standard Specifications
4	Department	Standard Plans
5	Department	Construction Site Best Management Practices (BMPs) Manual
6	Department	Storm Water Pollution Prevention Plan (SWPPP) and Water Pollution Control Program (WPCP) Preparation Manual
7	Department	Project Planning and Design Guide
8	Department	Construction Manual
9	Department	Design Information Bulletin 83
10	FHWA	Hydraulic Engineering Circular Number 21 (HEC-21) Design of Bridge Deck Drainage Systems

12.2.2 References

Use the references listed below as supplementary guidelines for the drainage systems analysis and design. These publications have no established order of precedence.

Drainage Publications References

Agency	Title
AASHTO	Roadside Design Guide
AASHTO	Model Drainage Manual
Department	Ready –To-List and Construction Contract Award Guide (RTL Guide)
Department	Fish Passage Design for Road Crossings

FHWA	Hydraulic Design and Procedures Manual
FHWA	Hydraulic Engineering Circulars [as listed in Department (Caltrans) Highway Design Manual]
FHWA	Hydraulic Design Series (as listed in Caltrans Highway Design Manual)

12.2.3 Preliminary Engineering Plans

The Preliminary Engineering Documents show only a preliminary design for the Project. These drawings and the supporting electronic files are included to illustrate the general scope of improvements. Verify all information prior to use.

The Design-Builder shall have the flexibility to make Project changes without impairing the essential functions and characteristics of the Project, such as safety, traffic operations, durability, desired appearance, maintainability, environmental protection, drainage, and other permitted constraints.

12.2.4 Software

The Design-Builder shall choose drainage design software from various drainage software packages listed in the Department *Highway Design Manual* for analyzing and designing all systems.

The Design-Builder shall prepare drawings in MicroStation and CAiCE by AutoDesk on the same version in use by the Department on the date of Final RFP.

12.2.5 Data Collection

To establish a drainage system that complies with the requirements and accommodates the historical hydrologic flows in the Project limits, the Design-Builder is responsible for collecting all necessary data, including the elements outlined below:

The Design-Builder shall identify all water resources issues, using available data, including water quality requirements as imposed by local, State, and federal government regulations; National Wetland Inventory and other wetland/protected waters inventories; and official documents concerning the Project, such as the environmental studies. The Design-Builder shall also acquire local agency drainage and stormwater management plans, and records of citizen concerns.

Water resources issues include areas with historically inadequate drainage (flooding or citizen complaints), environmentally sensitive areas, localized flooding, and maintenance problems associated with drainage and areas known to contain hazardous waste. The Design-Builder shall also determine watershed boundaries, protected waters, county ditches, areas classified as wetlands, floodplains, and boundaries between regulatory agencies (i.e., watershed districts and watershed management organizations).

The Design-Builder shall acquire existing storm drain plans and/or survey data, including all data on culverts, drainage systems, and storm sewer systems within the Project area. The Design-Builder shall also determine existing drainage areas that contribute to the highway drainage system and the estimated runoff used for design of the existing system.

The Design-Builder shall obtain additional photogrammetric and/or geographic information system (GIS) data for the Project area that depicts the outstanding resource value waters and/or impaired waters. The Design Builder shall collect additional data and information not included in the RID required for the hydraulics analysis.

12.2.4 Coordination with Other Agencies and Disciplines

The Design-Builder shall coordinate all water resource issues with local agencies, affected interests, and regulatory agencies. The Design-Builder shall document the resolutions of issues for the correspondence file, including meeting minutes and memoranda for the record.

The Design-Builder shall comply with and document the permit requirements, modifications, and contacts with the permitting agencies.

12.3 Design Requirements

The Design-Builder shall remove the existing drainage facilities, where necessary, within the Project Limits and design and construct new drainage facilities to accommodate Project and off-Site drainage and meet all applicable requirements. Drainage facilities shall be compatible with existing and/or proposed drainage systems in adjacent properties and shall preserve existing drainage patterns. Where drainage patterns must be changed from existing patterns, the Design-Builder shall secure all permits, drainage easements, local agency and Department approval prior to construction of any drainage facilities.

The Design-Builder shall develop a Project Drainage Overview Map, which shall serve as the base plan for final drainage design. The Project Drainage Overview Map shall show the existing drainage features and proposed Project drainage master plan, including drainage areas and contributing flows of existing and proposed drainage. The Project Drainage Overview Map shall also show impacts from the Project and proposed mitigation within the Map extents; and all waters of the State, outstanding resource value waters and impaired waters within 2,000 feet of the Project, or waters receiving Project runoff, and comply with permit or local agency requirements.

12.3.1 Project Specific requirement

Install a type G1 and G2 drainage system under the Ave.16 Bridge on the northbound side by the shoulder to drain to the outside of the roadway. Use 18”Dia. reinforced concrete pipe. Install a flared end section

12.3.2 Surface Hydrology

12.3.2.1 Design Frequencies

The drainage design frequencies shall be as indicated by the Department (*Caltrans*) *Highway Design Manual*, but in no instance shall the storm sewer system be designed for a frequency less than the 10-year rainfall event.

The Design-Builder shall use rainfall intensity and design storm criteria specified in the Department (*Caltrans*) *Highway Design Manual*. The Design-Builder shall evaluate flood potential for extreme storms, including areas inundated and flow routes for water leaving the Department facilities

12.3.2.2 Hydrologic Methods

The Design-Builder shall perform hydrologic analyses and follow design methodology as prescribed by the Department *Highway Design Manual*.

Ponding problems are known to exist under Avenue 16 Bridge post mile 12.75

For design rainfall total amounts, the Design-Builder shall use the IDF 2000 and the Department *Highway Design Manual*. The drainage areas shall be modeled to include future development and increased runoff associated with development. Flood damage potential for the completed Project shall not exceed pre-Project conditions.

12.3.3 Permanent Stormwater Treatment System

The Design-Builder shall design and construct stormwater treatment systems to meet requirements for water quality, water quantity, and rate control, as determined by local, State and federal requirements and the Department NPDES regulations.

Within the Project limits and excluding the areas defined by Section 12.3.1, the Design-Builder may use confined engineering structures such as wet vaults, hydrodynamic, or proprietary sediment control devices to treat the stormwater from the Project. If confined engineering structures are used, the Design-Builder shall meet the following requirements:

- The structure(s) shall remove a minimum of 80 percent of 50-micron particles during rainfall events created by 1-inch of runoff from the contributing area.
- The structure(s) shall be sized to treat the storm water flows from an amount of impervious equal to 100 percent of the impervious area contained within the Department Right of Way and the Project limits excluding the areas defined in Section 12.3.1. No less than 90 percent of the actual impervious area used for the design shall be from the Department Right of Way.
- The structure(s) shall also be sized to treat a minimum of an additional 10 percent of the off-Project drainage areas.
- Overflow bypass for treatment devices for events higher than one inch of runoff from the contributing area shall be designed to meet applicable regulatory requirements.
- The Design-Builder shall perform flood routing analysis. The Design-Builder shall perform detailed routing analysis for treatment devices affected by significant environmental issues such as hazardous waste or groundwater concerns.
- The structure(s) may be constructed within the Right of Way shown for the Project on the Right of Way Work Map.

12.4 Construction Requirements

Drainage shall be designed to accommodate construction staging and shall be provided during all stages of construction. The Design-Builder shall provide drainage design details for each stage of construction. The design shall include temporary erosion control and other Best Management Practices needed to satisfy the NPDES and other regulatory requirements. The water resources notes in the plans shall include a description of the drainage design for each stage of construction.

The Design-Builder shall obtain Department and local agency approval for abandonment methods for all existing drainage features that the Design-Builder is abandoning with this Project.

Storm sewer construction can occur by either open cut or trenchless methods-

Existing sanitary sewer and water main utilities shall remain in place and active.

The Design-Builder shall phase construction activities to maintain detour routes and traffic during storm sewer installation.

The Design-Builder shall coordinate all construction activities with businesses impacted by the construction including but not limited to Madera, Towing and Repair.

All surfaces impacted by construction shall be restored.

Storm sewer within the roadway area being milled and overlaid shall remain in place. Castings shall be adjusted if needed on a case-by-case basis to meet the required casting depth below pavement. If castings need adjusting, they shall be raised as a whole. No additional rings shall be added to supplement for raising the entire casting assembly.

The following pipe joints shall be tied:

- All joints either within 100 feet of an outlet or from the last manhole prior to the outlet, whichever is less
- All bend sections and three joints on each side of bend

12.5 Deliverables

12.5.1 Project Drainage Overview Map

The Design-Builder shall submit a Project Drainage Overview Map to the Department for Acceptance prior to initiating detailed design, and shall submit a copy of the Project Drainage Overview Map in MicroStation format.

12.5.2 Released for Construction Documents (RFC)

The Design-Builder shall produce plans and specifications in a format that facilitates design review by the Department. The Released for Construction Documents shall include the following items:

- Drainage Area Map with time of concentration (Tc) and curve numbers and/or runoff coefficients.
- Drainage/Utility plans including the SWPPP
- Drainage/Utility profiles
- Drainage tabulations and estimated quantities
- Drainage calculations and drainage models
- Temporary and permanent erosion control plans
- Specifications and Special Provisions

12.5.2.1 Drainage/Utility Plans

- Provide drainage structure data (type, location, diameter, length, class tabulations) and details, roadway cross slope and super elevation, and a complete set of roadway cross-sections to show the construction staging and associated temporary drainage.
- Label alignments, stationing, walls, bridges, paths/walks, lakes, rivers, environmentally sensitive areas, R/W and easements, existing drainage structures, proposed drainage structures, surface flow arrows, riprap locations, and ditch blocks.
- Show existing and proposed contours, high and low point station and elevation, roadway cross slope and super elevation, ponds, normal water line, high water line, and coordinate grid ticks and labels (minimum of three per sheet).
- Show dimensions for roadways and shoulders.

12.5.2.2 Drainage/Utility Profiles

- Label elbows, bends, reducers, existing and proposed ground lines, Utilities adjacent to structures or pipes, pipe data (type, diameter, length, class), and structure numbers.
- Show existing structures or pipes (dashed) and existing and proposed ground lines.

12.5.2.3 Drainage Tabulations

- Provide structure/pipe data (type, diameter, length, class, structure numbers, guide post locations, station and offset for aprons, pipes, and structures).

12.5.2.4 Temporary and Permanent Erosion Control Plans

- The Design-Builder shall label alignments, stationing, walls, bridges, paths/walks, lakes, rivers, environmentally sensitive areas, R/W and easements, existing drainage structures and

pipes, proposed drainage structures and pipes, surface flow arrows, riprap locations, ditch blocks, biorolls, blankets, seed mixes, mulch, and other erosion control items.

- Show high and low point station and elevation, ponds, normal water line, high water line, coordinate grid ticks and labels (minimum of three per sheet), land feature changes, erosion control features, and notes.
- Show dimensions for roadways and shoulders.

12.5.2.5 Specifications and Special Provisions

If the Design-Builder requests the Department's approval to use methods or materials that are not the Department standards, such request should include comprehensive specifications and provisions associated with the proposed non-standard methods or materials. A minimum 72-hour review period applies.

12.5.3 Reports/Project Documentation

The Design-Builder shall provide the Department with a Drainage Design Report signed by a California-licensed Professional Engineer, which shall be a record set of all drainage computations, both hydrologic and hydraulic, and all support data. The Report shall include:

- Hydraulic notes, models, and tabulations
- Culvert designs and reports for major stream crossings
- Pond designs, including graphic display of treatment areas and maintenance guidelines for operation
- Complete set of calculations and detailed drainage area maps
- Grit chamber, proprietary device, and any underground storage device designs and maintenance manuals (including recommended maintenance and inspection timelines).
- Correspondence file

The Design-Builder shall prepare bound reports and Project documentation in hardcopy and electronic format, organized by design topic, and delivered to the Department prior to Final Acceptance.

The Design-Builder shall deliver an inventory of the hydraulic infrastructure of the completed Project by providing a GEOPAK Drainage GDF file of all installed pipes and structures.

12.5.4 As-Built Plans

Upon completion of the Project, the Design-Builder shall deliver to the Department a complete set of As-Built Documents and design files that incorporate all design changes and details of Accepted Work that occurred throughout the Project. The As-Builds shall be signed by a licensed California Professional Engineer.

13 [NOT USED]

14 [NOT USED]

15 [NOT USED]

16 SIGNING, PAVEMENT MARKINGS, SIGNALIZATION, AND LIGHTING

16.1 General

The Design-BUILDER shall conduct all Work necessary to meet the requirements for permanent signing, permanent pavement marking, permanent signalization, and permanent lighting for the Project.

The Design-BUILDER shall coordinate with local agencies to ensure the appropriate design methods, procedures, submittals, plan preparation, analysis methodology, review and comment processes, approval procedures, specifications and construction requirements are met.

16.2 Administrative Requirements

16.2.1 Standards

16.2.1.1 General Standards

The Design Builder shall design and construct the Signing, Pavement Marking, Signalization, and Lighting in accordance with the requirements of the standards listed by priority below.

If there is any conflict in standards, adhere to the standard with the highest priority. However, if the Design-BUILDER's Submittal has a higher standard than any of the listed standards, adhere to the Submittal standard.

If there is any unresolved ambiguity in standards, it is the Design-BUILDER's responsibility to obtain clarification before proceeding with design and/or construction. Use the most current version of each listed standard as of the Request for Proposals (RFP) issue date unless modified by Addendum or Change Order.:

16.2.1.2 Permanent Signing Standards

Priority	Agency	Title
1	Department	California Manual on Uniform Traffic Control Devices (CA MUTCD)
2.	Department	Highway Design Manual
3	Department	Special Provisions
4	Department	2006 Revised and New Standard Plans
5	Department	Standard Plans May 2006
6	Department	Design-Build Modifications to the Standard Specifications
7	Department	Standard Specifications
8.	Department	Sign Specifications
9.	Department	HOV Guidelines for Planning, Design, and Operations
10.	Various	Technical Memoranda
11.	AASHTO	A Policy on Geometric Design of Highways and Streets
12.	AASHTO	Standard Specifications for Structural Support for Highway Signs, Luminaires, and Traffic Signals, 4 th Edition with 2002, 2003, and 2006 Interims
13.	AASHTO	Roadside Design Guide
14.	Department	Plans Preparation Manual
15.	Department	CADD Users Manual

*Document modified for design-build.

16.2.1.3 Pavement Delineation Standards and Requirements

Priority	Agency	Title
1	Department	California Manual on Uniform Traffic Control Devices (CA MUTCD)
2.	Department	Highway Design Manual
3	Department	Special Provisions
4	Department	2006 Revised and New Standard Plans
5	Department	Standard Plans May 2006
6	Department	Design-Build Modifications to the Standard Specifications
7	Department	Standard Specifications
8.	Department	Sign Specifications
9.	Department	HOV Guidelines for Planning, Design, and Operations
10.	Various	Technical Memoranda
11.	AASHTO	A Policy on Geometric Design of Highways and Streets
12.	AASHTO	Roadside Design Guide
13.	Department	Plans Preparation Manual
14.	Department	CADD Users Manual

*Document modified for design-build.

16.2.1.4 Traffic Signal Standards

Priority	Agency	Title
1	Department	California Manual on Uniform Traffic Control Devices (CA MUTCD)
2.	Department	Signal and Lighting Guidelines
3	Department	Signal Design Detail Sheets
4	Department	Ramp Meter Design Manual
5	Department	Special Provisions
6.	Department	2006 Revised and New Standard Plans
7	Department	Design-Build Modifications to the Standard Specifications
8	Department	Standard Specifications
9.	AASHTO	Roadside Design Guide
10.	Department	Standard Plans Signal and Lighting Design Guide
11.	Department	CADD Users Manual
12.	Department	Plans Preparation Manual

*Document modified for design-build.

16.2.1.5 Permanent Lighting Standards

Priority	Agency	Title
1	Department	Roadway Lighting Design Manual
2.	Department	CADD Data Standards (Lighting Cell Library)
3	Department	Signal and Lighting Guidelines
4	Department	Special Provisions
5.	Department	2006 Revised and New Standard Plans
6	Department	Standard Plans May 2006
7.	Department	Design-Build Modifications to the Standard Specifications
8	Department	Standard Specifications
9.	Various	Technical Memoranda
10.	Department	Plans Preparation Manual
11.	ANSI	Illuminating Engineering Society of North America Roadway Lighting ANSI Approved
12.	AASHTO	Roadway Lighting Design Guide

*Document modified for design-build.

16.2.2 References

Use the references listed below as supplementary guidelines for the design and construction of signing, pavement marking, signalization, and lighting

Agency	Title
Department	New Policy and Directives (Pavement Delineation and Signing)
Department	Ready to List and Construction Contract Award Guide (RTL Guide)
Department	Reference Sheets for Structural Design Aids Overhead and Roadside Signs
Department	Standard Highway Signs
EIA	Electronics Industries Alliance (EIA) Standards
NCHRP	Report 350 – Recommended Procedures for the Safety Performance Evaluation of Highway Features
NEMA	National Electrical Manufacturers Association (NEMA) Standards
TIA	Telecommunications Industries Association (TIA) Standards

16.2.3 Local Road System

The Design Builder shall design and construct all local signalization improvements in accordance with the applicable Madera County standards, specifications and requirements within these technical provisions.

16.2.4 Preliminary Engineering Documents

The Preliminary Engineering Documents in the Reference Information Documents show only a preliminary design for the Project. These drawings and the supporting electronic files are included to illustrate the general scope of improvements. Verify all information prior to use.

The Design Builder shall have the flexibility to make Project changes without impairing the essential functions and characteristics of the Project, such as safety, traffic operations, durability, desired appearance, maintainability, environmental protection, drainage, and other permitted constraints; provided that the

Design Builder shall perform the Work in accordance with the Standards and Requirements set forth in these Technical Provisions unless the Design Builder obtains a deviation or Exception those Standards or Requirements in accordance with the design review process set forth in the Design Build Contract.

16.2.5 Software Requirements

The Design Builder shall prepare drawings in MicroStation SE and CaiCE Version 10SP6 as the drafting and design software, respectively, in addition to other software used by the Design Builder as the drafting and design software, respectively.

The Design-Builder shall use the latest version of SignCAD, by SignCAD Systems, Inc. to design signs

16.2.6 Meetings

Department, and the Design Builder shall meet at the request of one of the parties, as necessary, to discuss and resolve matters relating to the Signing, Lighting, Pavement Marking, and Signalization Work during the design and construction stages. The requesting entity shall provide the other parties with not less than five (5) days prior notice of such meetings. The Design Builder shall prepare and distribute within five (5) days of the meeting a record of the minutes to the meeting.

16.2.6.1 Permanent Signing Meetings

The Design-Builder shall take an inventory of all in-place signing in the Project. The Design-Builder shall schedule one or more permanent signing concept meeting(s) 30 Days after NTP1 to present a sketched layout of the in-place signing on the Project to the Department Traffic Engineer. The Design-Builder shall use the meeting to determine the permanent signing needs of the Project.

16.2.7 Coordination with Other Agencies and Disciplines

The Department will assist in the coordination and resolution of all signalization issues with affected interests and regulatory agencies. The Design Builder shall document the resolutions of issues for the correspondence file, including meeting minutes and memoranda for the record. The Design Builder shall document the permit requirements and contacts with the permitting agencies.

16.2.8 Certification Requirements

The Design Builder shall perform all laboratory testing at a Department certified and approved lab and an AMRL-accredited facility for material tests required by this section. All material testers are to be certified for the materials they are testing.

16.3 Design Requirements

16.3.1 Permanent Signing

Design, furnish, and install all components of a sign system necessary to provide a complete and functional system that meets the following performance requirements:

- Provide for the orderly and predictable movement of all traffic.
- Provide such guidance and warnings as are needed to ensure the safe and informed operation of individual elements of the traffic stream.

The Design Builder must get Approval for all signing plans and all interstate signing.

The Design Builder shall light regulatory signs on overhead sign structures. The Design Builder shall light all signs on the overhead sign structure if one sign on the structure requires lighting.

All Overhead signs structures shall meet the vertical clearance requirements over the entire length of the pavement and shoulders as specified in the CA MUTCD.

The Design Builder shall supply all sign panels.

16.3.1.1 Signing Concept Meetings

The Design Builder shall take an inventory of all in-place signing in the Project. The Design Builder shall schedule and participate in a signing concept meeting to present a layout of the in-place and proposed signing on the Project.

The Design Builder shall design all temporary signing systems to comply with the same design and construction requirements as that of the permanent signing systems.

The Design Builder shall prepare all necessary engineering studies and applicable design reports to justify all the project signing elements used in the project.

The Design Builder shall use the outcome of the meeting to finalize the signing needs of the Project.

16.3.1.2 Signing Plan Requirements

The Design Builder shall develop a Signing Plan for the project to:

- Provide for modification of any signage outside the Planned Right of Way limits that is rendered inaccurate, ineffective, confusing, or unnecessary by the Project. Such modifications may include the addition, removal, or replacement of signs and appurtenances.
- If permanent signing is erected by the Design-Builder that could be used for motorist guidance, continue to display such signing during the remaining construction of the Project.
- Maintain existing Guide signs for on-off ramps, Interstate guide signs, Warning signs, Regulatory signs, Airport signs, and Hospital signs during all phases of construction.
- Replace all existing signs within the Planned Right of Way limits.
- All off-ramps must have intersection lane control signing (on both sides of the off-ramp for multiple lanes) for temporary (that exist for more than seven days) and permanent off-ramp lane configurations at the beginning of the turn lanes and at the intersection (mast arm mounted where possible)
- The Signing plan shall provide for modifications to signage outside the Planned Right of Way limits that are rendered inaccurate, ineffective, confusing, or unnecessary by the Project. Guide signs include route marker assemblies, directional, distance, and information signs. The modifications shall include the addition, removal, or alteration of signs and appurtenances.
- Include all necessary guide, warning, supplemental, sequential, and regulatory signs for the mainline, ramps, and interchanges, as well as for the arterial streets, frontage roads, and any other roadways affected by the Project.
- Signs shall be located in such a manner that they do not conflict with other signs, vegetation, or structures and are clearly visible according to CA MUTCD standards.
- The Design Builder shall design and install guide signs and Trailblazer Signs outside of the final right of way for the Project. The scope of the Work for signs located outside of the final right of way includes new signs and modifications to existing sign panels and structures.

- The Design Builder will install signs located outside of the final right of way in existing rights-of-way controlled by other local agencies. The Design Builder shall coordinate with the applicable local agency for the design and installation of the guide and trailblazer signs outside of the final right of way.

- Guide signs shall include route marker assemblies, directional, distance, and information signs.

The Signing Plan shall include as a minimum, the following requirements:

- Sign locations
- Panel legends
- Proximity to Intelligent Transportation System (ITS) devices, including Changeable Message Sign (CMS) locations
- Types of proposed sign structures
- Signal system mast arm sign legends

16.3.1.3 Material Requirements

Traffic signs shall be constructed in accordance with the provisions of the Department *Standard Specifications* and the Department *Standard Plans*. The Design Builder shall provide signing materials that:

- Are new at the time of installation;
- Unless otherwise noted herein, meet the requirements of the Department *Standard Specifications*;
- The Design Builder shall not reuse any existing sign materials as part of the permanent signing installation and shall dispose off the project site all removed signing materials and structures.

16.3.1.4 Sign panels for overhead and roadside signs along the mainline and ramps

The Design Builder shall provide signing materials that:

- Shall meet the standards for retro-reflective panels.
- Shall meet standard text size, border, legend, color, material and fabrication. The use of substandard (smaller) text size is not acceptable. The sign panel shall be designed to accommodate the standard legend and border.
- Shall include exit numbers in the sign with the legend per the Department requirements.
- English units shall be used only, rounded down instead of up for distances.

16.3.1.5. Overhead Sign Structures

16.3.1.5.1 Existing Overhead Sign Structures

All existing overhead signs structures shall meet the following requirements:

- Overhead sign structures shall be evaluated for adequate strength per American Association of State Highway and Transportation Officials (AASHTO) and the Department standards. Sign structures found to have with inadequate strength shall be replaced with new sign structures.
- Overhead sign structures located in the mainline median shall be replaced with new signs on the right side of the roadway.

- Overhead sign structures with posts/foundations on the mainline or ramps that are fixed objects shall be identified and corrected to meet design current standards.
- Overhead sign structures shall be upgraded to meet new safety cable railing standards.

16.3.1.5.2. New Overhead Sign Structures

All new overhead sign structures shall meet the following standards:

- Overhead sign structures shall be of truss type.
- Overhead sign structures shall be designed for fully loaded conditions and per the Department requirements.
- Overhead sign structures shall conform to the Department welding requirements.
- Overhead sign structures shall have a minimum vertical clearance of 18 feet over the roadbed.
- Overhead sign structures shall not be placed in the median, except High Occupancy Vehicles (HOV) signs.
- Overhead sign structures shall be illuminated if structure is a guide signs or combination of HOV and guide signs.

Roadside signs along the mainline and ramps shall be mounted on wood posts; except for metal barrier or rail-mounted signs. All sign supports shall include breakaway devices.

16.3.1.6. Sign Design

Design Overhead signs that meet the following requirements:

- Minimum clearance: 17.5 feet over the entire length of the pavement and shoulders; and
- Illumination: Externally illuminated with HPS lamps, per Performance Specification for Lighting.

16.3.1.7 Lettering Height

- For variable message signs, 1,000 feet minimum unobstructed view and a minimum 800 feet in advance of a guide sign;
- Space guide signs apart at 800 feet minimum and 1,000 feet minimum in advance of a variable message sign;
- Interchange exit number panel width: As per the CAMUTCD and use the smaller width tabs that are justified for exit numbers. Exceptions to this are only when the exit number panel controls the width of the sign or when the width of the exit number panel is less than 2 feet smaller than the width of the full sign, in which case the exit number panel width is increased to match the overall sign width. Justification of the exit number is still required.
- Milepost Posts: Spaced per the Department Standards
- Detour trailblazing signs: All signs must be black on orange except freeway route markers and must indicate from top to bottom:
 - ✓ “Detour” or “Alt”;
 - ✓ North, South, East, West (if necessary);
 - ✓ “Route Shield” or “Street Name”;
 - ✓ Directional Arrow; and

- ✓ “End Detour” when existing trailblazing is resumed.

16.3.1.8 Other Signage Requirements

Do not attach signs to any bridge structure unless no alternative exists.

16.3.2 Permanent Pavement Marking

Pavement delineation Work shall include designing, installing, modifying, or removing striping and pavement markings. All pavement delineation shall conform to the CA MUTCD, the Department *Standard Plans* and *Standard Specifications*. The Design Builder shall prepare pavement delineation plans that show HOV striping, edge striping, lane line striping, arrows, legends, and pavement markings consistent with the needs of the project. The Design Builder shall design all temporary pavement delineation to comply with the same design and construction requirements as that of the permanent delineation. The Design Builder shall prepare all necessary engineering studies and applicable design reports to justify all the project pavement delineation elements used in the project.

Design, furnish, and install all components of a pavement delineation system necessary to provide a complete and functional system that meets the following performance requirements:

Provide for the orderly and predictable movement of all traffic.

Provide such guidance and warnings as are needed to ensure the safe and informed operation of individual elements of the traffic stream.

The Design Builder shall design and install both temporary and permanent pavement delineation as required to complete the Work. Pavement delineation shall be in accordance with applicable Department and CA MUTCD standards. The scope of the pavement delineation includes striping, raised pavement markers, and roadway delineators.

16.3.2.1 Pavement Delineation Concept Meetings

The Design Builder shall take an inventory of all in-place pavement delineation elements in the Project. The Design Builder shall schedule and participate in a pavement delineation concept meeting to present a layout of the in-place and proposed pavement delineation on the Project to the Department. The Design Builder shall use the outcome of the meeting to finalize the pavement delineation needs of the Project.

16.3.2.2 Pavement Delineation Plans

The pavement delineation plans (permanent or temporary) shall include the following:

- A plan view of the entire Project or roadway segment to have pavement delineation.
- All existing pavement delineation for a minimum of 500 feet past the limits of construction and adequate transition and tapers to maintain traffic at the design speed.
- Existing pavement delineation identified by material type, color, and width and completely dimensioned pavement delineation across the roadway.
- Identification of pavement delineation to be removed.
- All new pavement delineation identified by material type, color, line width and completely dimensioned pavement delineation across the roadway, tying the pavement delineation to a construction centerline or monument line.
- Location by station or dimension lines all proposed pavement arrows, legends, crosswalks, and other pertinent features.

- Design drawings other than the Department standard drawings that show details of pavement delineation, tapers, and transitions.

16.3.2.3 Pavement Delineation Material Requirements

The Design Builder shall provide permanent or temporary pavement delineation that meets the Department *Standard Specifications*. The permanent pavement markings shall be uniform in type, color, dimensions, location, and reflectivity as if in new condition.

16.3.2.4 Striping and Pavement Markings

All striping details shall conform to the CA MUTCD, the Department *Standard Plans* and *Standard Specifications*, and the Department *HOV Guidelines for Planning, Design, and Operations*.

All striping and pavement markings on the mainline and ramps shall be thermoplastic. All markers on the mainline shall conform to the Department *Standard Plans*.

Striping and pavement marking modifications that may be required on local streets shall conform to standards required by local jurisdictions.

16.3.3 [NOT USED]

16.3.4 [NOT USED]

16.3.5 [NOT USED]

16.3.6 Electrical Design

16.3.6.1 Electrical Design Concept Meeting

The Design Builder shall take an inventory of all the existing electrical elements in the Project.

The Design Builder shall schedule and participate in an Electrical concept meeting to present a layout of the in-place and proposed Electrical systems on the Project.

Electrical design plans for all electrical design systems shall conform to the following requirements:

- Existing electrical systems shall be shown.
- Identified power sources shall be shown on the plans clearly indicating the respective source locations (regardless of the design segment). Terminated conduit run with the note "service location as part of other segment" will not be acceptable.
- Equipment numbers shall correspond to their post mile location. Northbound numbering shall be even numbered.

The following electrical elements may be in the same service cabinet and on the same meter, but each shall have a separate circuit breaker:

- Traffic monitoring stations
- CCTV
- Irrigation
- Highway safety lightings
- Photoelectric controls

A separate electrical service meter in a service cabinet shall be provided for changeable message sign (CMS) and communication hubs.

All appurtenances shall comply with the horizontal clearance requirements in the *Highway Design Manual*.

16.3.6.2 Traffic Signal Design Requirements

All temporary and permanent traffic signals shall be designed per the Department requirements.

16.3.6.3 Specific Requirements

All ramp meter signals shall include all new traffic signal equipment, including conduit and pull boxes, Model 170 controller assemblies in Model 334 cabinet, light emitting diode (LED) signal heads and poles, mast arms, and electrical service.

16.3.7 Permanent Lighting

Design, furnish and construct all components of a roadway lighting system necessary to provide a complete and functional system that meets the following performance requirements:

- Durable;
- Provide good uniformity at intersections and interchanges to create a safe and comfortable environment for those who use the facility;
- Avoid light pollution and light trespass outside of the corridor;
- Avoid disability or discomfort glare to users; and
- Provide for ease of maintenance and of servicing.

As a minimum, provide lighting design and installation at all interchanges, signalized intersections, off-ramp gore areas, under structures, and for signs as specified in this section.

Electrical Work shall include designing, furnishing, installing, modifying, maintaining, during construction relocating, or removing of traffic signals, flashing beacon systems, lighting systems, and sign illumination systems. Design Builder shall also be responsible for the electrical Work, for traffic monitoring stations, communications systems, electrical equipment in structures, falsework lighting, provisions for future systems or combinations thereof, and irrigation controllers.

The Design Builder shall prepare all necessary engineering studies and applicable design reports to justify all the project lighting system elements used in the project. Design and construct the lighting system to minimize lane closures during post-construction maintenance

16.3.7.1 Lighting Concept Meeting

The Design Builder shall take an inventory of all the existing lighting elements in the Project. The Design Builder shall schedule and participate in a lighting concept meeting to present a layout of the in-place and proposed lighting system on the Project to the Department.

The Design Builder shall use the outcome of the meeting to finalize the lighting system needs of the Project.

16.3.7.2 Photometric Analysis

The Design-Builder shall complete a Photometric Analysis that includes the following:

- Lighting intensities and uniformity, light pole locations and heights, luminaire types, wattage and brightness, and quantities of each
- Lighting calculations accounting for the anticipated loss of light due to lamp lumen depreciation (LLD) and lamp dirt depreciation (LDD)
- When adjacent to residential areas, the maximum spillover lighting allowed shall be 0.2 foot-candles at ground level on residential properties
- Consideration of roadway safety, ease and cost of maintenance, cost of construction, consistency with adjacent roadway lighting designs, annual energy costs, and provision for future lighting needs and local planning policies
- Lighting distances from the light source at the following lighting levels: 1.0 foot-candle, 0.5 foot-candle, and 0.2 foot-candle for all edges of pavements, shoulder lines, lane lines, Right of Way, and 150 feet outside of Right of Way

The Design-Builder shall consider, but not to required to use the three dimensional aspects of the roadway with respect to the positioning of the illumination assemblies (i.e., roadways, ramps, overpasses, etc., are typically at varying vertical and horizontal distances from the luminaries being used to light the roadways).

16.3.7.3 Lighting Under Structures

The Design Builder shall provide understructure lighting for all structures (except box culverts) within the Project limits.

The Design Builder shall provide lighting that is consistent with the luminance levels and uniformity of the surrounding lighting system.

The Design Builder shall design, furnish, and construct all understructure lighting to eliminate the need for lane closures during post-construction maintenance and shall locate luminaries to reduce the likelihood of tampering and damage by vandals.

Levels of illumination required under bridges shall be a minimum of 4.0 foot-candles measured horizontally on the surface of the walkway and vertically at a height of 6 feet above finished grade, with an average to minimum illumination uniformity ratio of 3:1.

16.3.7.4 Spillover Light

The Design Builder shall limit spillover lighting outside of the Planned Right of Way limits.

16.3.7.5 Specific Requirements

When encountering a retaining wall during placement of the lighting poles, the Design Builder shall mount the pole on the retaining wall and adjust the length of the pole to maintain the appropriate mounting height.

During the course of the Contract, the Design Builder shall respond to complaints of residents adjacent to the Project and take necessary measures to mitigate any issues resulting from the new lighting system.

The Design Builder shall design all new permanent lighting systems to be 120/240 volts. The Design Builder shall consider locations of nearby guardrail, noise walls, retaining walls, utilities, and overhead power lines when placing light poles. The Design Builder shall install electrifiers with slip bases within the recovery clear zone unless otherwise protected by MBGR or concrete barrier.

The Design Builder shall design all temporary lighting system to comply with the same design and construction requirements of the permanent systems.

16.3.7.6 High Mast Lighting

High mast lighting shall not be used on this project.

16.3.7.7 Electrical Service

Intersection safety lighting shall be in accordance with the Department Standards.

Service for all elements shall be standard 120/240-volt (V) service. The Design Builder shall be responsible for obtaining new or modified electrical service and telephone service points, including all applications and permits required from the serving utility company, and XY standard forms in the case of new telephone services. The Design Builder shall refer to the Utilities section in the technical provisions for utility requirements.

Separate service conduits shall be used for lighting circuits, Traffic Monitoring Systems (TMS), Closed Circuit Television (CCTV), and from the service cabinet meter to the load. Large conduits with inner ducts to route the conductors for these separate circuits will not be acceptable.

Design Builder shall be responsible for all electrical utility costs of the new or modified system, unless otherwise stated, following any change in loading on an existing meter, relocation of a meter, or installation of a new meter. This responsibility shall continue until Final Acceptance.

The Department shall pay for existing power for the mainline and ramp lighting as long as the existing lighting is in use. Notify the Department at least seven (7) days before disconnecting the existing lighting from power. At each location where temporary lighting will be provided, the Design Builder shall pay the temporary lighting costs until the final lighting facilities are in place and have been accepted. The Department will then resume payment responsibility for power for lighting.

Local agencies shall pay for power for lighting at the signalized intersections. Notify them at least seven calendar days before disconnecting the power. The Design Builder shall provide temporary lighting for each signalized intersection and pay the temporary lighting costs until the final lighting facilities are in place and have been accepted. Local agencies will then resume payment responsibility for power for lighting.

16.3.7.8 Arterial Streets and Frontage Roads

Provide lighting on signalized intersections located on all arterial streets, and frontage roads within the Project limits. Provide standard roadway luminaries on signal pole extensions at each corner of signalized intersections. Replace-in-kind and supplement, as appropriate, any existing roadway lighting affected by Project construction to meet the requirements of the roadway configuration

16.3.7.9 Sign Lighting

Provide a fused disconnect switch for ease of maintenance. Mount disconnect switch on the sign structure pole. Make wire splices in the junction box, or the splice box located behind the sign. Wire splices within the sign structure are not acceptable.

16.3.8 Electrical Design

16.3.8.1 Electrical Design Concept Meeting

The Design Builder shall take an inventory of all the existing electrical elements in the Project. The Design Builder shall schedule and participate in an Electrical concept meeting to present a

layout of the in-place and proposed Electrical systems on the Project to the Department Electrical design plans for all electrical design systems shall conform to the following requirements:

- Existing electrical systems shall be shown.
- Identified power sources shall be shown on the plans clearly indicating the respective source locations (regardless of the design segment). Terminated conduit run with the note "service location as part of other segment" will not be acceptable.
- Equipment numbers shall correspond to their post mile location. Northbound numbering shall be even numbered.

The following electrical element may be in the same service cabinet and on the same meter, but each shall have a separate circuit breaker:

- Traffic monitoring stations
- Highway safety lightings

A separate electrical service meter in a service cabinet shall be provided for changeable message sign (CMS) and communication hubs. All appurtenances shall comply with the horizontal clearance requirements in the Highway Design Manual.

16.4 Construction Requirements

Construction shall be in accordance with the requirements of the Standard Specifications and the Special Provisions.

The Design Builder shall use Materials listed on the Department Approved Products List for Work Zones and Signals. The Design Builder shall obtain the current Approved Products List.

The Design Builder shall make appropriate arrangements with the electric company for installation or relocation of power service.

16.4.1 Permanent Signing

The Design-Builder shall mark in the field locations of the proposed signs and conduct a construction design review with the Department before installation.

The Design-Builder shall obtain the Department acceptance of all sign locations in the field prior to installation.

16.4.1.1 Salvage

The Design Builder shall provide a Salvaging Material Plan. The plan shall show materials to be salvaged and reused. All other material to be removed that is not reused or salvaged shall become the property of the Design Builder and shall be removed from the freeway right of way in conformance with the Standard Specifications. Approval of the Salvaging Material Plan is required. The Design Builder shall receive a response within 15 days.

Permanent Pavement Marking

All pavement markings, permanent or temporary, where no longer required for traffic demarcation shall be completely removed.

16.4.3 Permanent Signalization

The Design Builder shall be responsible for locating and marking all underground utilities prior to any signal installation work.

The Design Builder shall provide maintenance for permanent or temporary signalization installations within the project limits until Final Acceptance of the Project.

16.4.3.1 Source of Power

The Design Builder shall coordinate with the local power supplier to provide the power service connection. The Design Builder shall pay all costs, unless otherwise noted, charged by the electric power companies for providing power connections. The Design Builder shall be responsible for contacting the electric utility to determine the source of power, to obtain exact locations of power poles and stub-outs for the permanent and temporary installations.

16.4.3.2 State Furnished Materials

The following traffic signal material will be furnished by the Department and installed by the Design-Builder:

- Controllers;
- Controller cabinets;

The Design Builder shall submit a request for State Furnished Material listing the type and number of signal materials at least 120 days prior to the date when the materials are required. The Department will place the order with the manufacturer, drop ship to the desired location and contact provided by the Design-Builder. If local agency requests painted signal poles clearly identify this on the State Furnished Material request letter. Coordinate with the local agency for color requested and include on the form. The finish will be powder coated paint over galvanized steel.

16.4.5 Permanent Lighting

Temporary lighting is required to be installed and operational prior to removal of the existing lighting systems and during false work installation.

16.4.5.1 Salvage

The Design Builder shall provide a Salvaging Material Plan. The plan shall show materials to be salvaged and reused. All other material to be removed that is not reused or salvaged shall become the property of the Design Builder and shall be removed from the freeway right of way in conformance with the Standard Specifications. Approval of the Salvaging Material Plan is required. The Design Builder s will receive a response within 15 days.

16.4.5.2 Lighting

The Design Builder shall provide maintenance for permanent or temporary lighting installations within the project limits until Substantial Completion of the Project.

16.4.5.3 Source of Power

The Design Builder shall coordinate with the local power supplier to provide the power service connection. The Design Builder shall pay all costs, unless otherwise noted, charged by the electric power companies for providing power connections. The Design Builder shall be responsible for contacting the electric utility to determine the source of power, to obtain exact locations of power poles and stub-outs for the permanent and temporary installations.

Deliverables

The Design-Builder shall develop Released for Construction (RFC) Documents, As-Built Plans and Final Design Documents in accordance with the requirements of these technical provisions.

16.5.1 Lighting Concept Plan

The Lighting Concept Plan (permanent or temporary) with incorporated comments received at the Lighting Concept Meeting shall be submitted 60 days after the concept meeting.

16.5.2 Electrical Concept Plan

The Electrical Concept Plan (permanent or temporary) with incorporated comments received at the Electrical Concept Meeting shall be submitted 60 days after the concept meeting.

16.5.3 Signing Concept Plan

The Signing Concept Plan (permanent or temporary) with incorporated comments received at the Signing Concept Meeting shall be submitted 60 days after the concept meeting.

16.5.4 Over-the-Shoulder Design Documents

During the design process, any submittals required in the Design Standards or other Contract Documents shall be prepared and submitted by the Design Builder. Submittals shall be in an acceptable format and organized to facilitate their review.

16.5.5 Released for Construction (RFC) Documents

The Design Builder shall produce plans and specifications in a format that aids and facilitates design review, and provide adequate information for safe, efficient, and high-quality construction. Plan sets and sheet types shall be developed in accordance with the Department CADD Standards, the Department Plans Preparation Manual, and the Design Quality Management Plan before construction may begin. Acceptance by the Department is required.

16.5.6 Final Design Documents

The Design Builder shall submit final design documents when final design is complete, including office and field generated design changes. Final design documents include:

- Plans
- Shop drawings
- Design calculations
- Reports/Project documentation
- Specifications and Special Provisions

16.5.7 Shop Drawings

Copies of Approved shop drawings shall be provided at least five (5) days prior to the start of any Work detailed by those drawings. Design Builder shall make no changes in any approved shop drawing after approval has been received. Any deviations from approved shop drawings shall require that the Design Builder submit revised shop drawings back for their approval.

Shop drawings for lighting structures and for Overhead sign structures shall be submitted for Acceptance prior to fabrication.

16.5.8 Design Justification Reports and Project Documentation

Upon request, the Design Builder shall submit design justifications when the Design Builder shall consider various factors or alternatives. Documentation may be computer generated or hand written and shall clearly identify the following:

- Design issue
- Items requiring consideration
- Basis for evaluation
- Final decision and justification

16.5.9 Non- Standard Specifications and Non- Standard Special Provisions

If the Design Builder requests Approval to utilize methods or materials that are not Caltrans standards, such request shall include comprehensive specifications and provisions associated with the proposed non-standard methods or materials.

16.5.10 As-Built Documents

Upon completion of the Project and prior to Final Acceptance, the Design Builder shall deliver a complete set of as-built documents and design files that incorporate all design changes and details of Accepted Work that occurred throughout the Project. As-Built Documents must be submitted in both hardcopy and electronic form. The As-Built Documents shall meet the format and content requirements of Final Design Documents.

17 INTELLIGENT TRANSPORTATION SYSTEMS (ITS)

17.1 General

The Design-Builder shall conduct all Work necessary to meet the requirements for intelligent transportation systems (ITS). The Design Builder shall take an inventory of all the existing ITS elements in the Project. The Design Builder shall design and construct the Work of installing the ITS elements shown in the Conceptual Plans. The scope of ITS Work shall include system planning, design, furnishing, installation, modifying, integration, testing, interim maintenance, and system acceptance of ITS.

The Design Builder shall coordinate with the local agencies to ensure that the appropriate design methods, procedures, submittals, plan preparation, analysis methodology, review/comment processes, approval procedures, specifications and construction requirements are met for ITS work within the Project

17.2 Administrative Requirements

17.2.1 Standards

The Design Builder shall perform the Work in accordance with the requirements of the standards listed by priority below.

If there is any conflict in standards, adhere to the standard with the highest priority. However, if the Design-Builder's Submittal has a higher standard than any of the listed standards, adhere to the Submittal standard.

If there is any unresolved ambiguity in standards, it is the Design-Builder's responsibility to obtain clarification before proceeding with design and/or construction. Use the most current version of each listed standard as of the Invitation for Bid (IFB) issue date unless modified by Addendum or Change Order.

Intelligent Transportation Systems Standards and Requirements

Priority	Agency	Title
1	Department	Traffic Manual
2	Department	2006 Revised and New Standard
3	Department	Standard Plans May 2006
4	Department	Design Build Modifications to the Standard Specifications for Construction
5	Department	Standard Specifications
6	Department	Construction Manual
7	Department	Technical Memoranda
8	Department	Plans Preparation Manual
9	AASHTO	Roadside Design Guide

*Document modified for design-build.

17.2.2 References

Use the references listed below as supplementary guidelines for the design and construction of the ITS system as appropriate.

ITS References Agency Title

Department	Transportation Electrical Equipment Specifications (TEES)
Department	Ready to List and Construction Contract Award Guide (RTL Guide)
NEC	National Fire Protection Agency National Electric Code (NEC) Standards, including Listing Requirements
U.S. Department of Transportation	National ITS Architecture
NEMA	National Electrical Manufacturers Association (NEMA) Standards
EIA	Electronics Industries Alliance (EIA) Standards
TIA	Telecommunications Industries Association (TIA) Standards
NTCIP	National Transportation Communications for ITS Protocol (NTCIP) Standards
ITE	Institute of Transportation Engineers (ITE) Standards
EIA/TIA	Fiber-Optic Test Procedure (FOTP) Standards
USDA	United States Department of Agriculture (USDA) Rural Utilities Service (RUS) Specifications

If the Design Builder requests Approval to use methods or materials that are not standards, such request shall include comprehensive specifications and provisions associated with the proposed non-standard methods or materials.

It is recommended that the Design Builder utilize the ITS Non-Standard Special Provisions (NSSPs) examples included in the Reference Document for the design and construction of the ITS system. These ITS NSSPs had been approved by HQ Traffic Operations on other projects and may be used on this project and need to be re-submitted for approval. If the ITS NSSPs examples listed in the Reference Document are not utilized by the Design Builder for the ITS design of the project, the Design Builder must request new specifications reviews and approvals before they can be accepted as part of the Project. The new specifications approval process requires a minimum of four (4) weeks for review and approval. Notwithstanding review and approval at the Integrated Personnel Office (IPO). National

17.2.3 Preliminary Engineering Documents

The Preliminary Engineering plans show only a preliminary design for the Project. These drawings and the supporting electronic files are included to illustrate the general scope of improvements. Verify all information prior to use.

The Design Builder shall have the flexibility to make Project changes without impairing the essential functions and characteristics of the Project, such as safety, traffic operations, durability, desired appearance, maintainability, environmental protection, drainage, and other permitted constraints; provided that the Design Builder shall perform the Work in accordance with the Standards and Requirements set forth in these Technical Provisions unless the Design Builder obtains a deviation or Exception to those Standards or Requirements in accordance with the design review process set forth in the Design Build Contract (Book 1).

17.2.4 Software Requirements

The Design Builder may at its own discretion use any software when submitting plans for approval but shall prepare the final drawings using MicroStation SE and CAiCE Version 10SP6 as the drafting and design software, respectively.

Design Builder shall use ITS devices that are compatible with the data requirements of the Caltrans District 6 Transportation Management Center (TMC) Automated Traffic Surveillance

and Control (ATSAC) systems software. Due to new technology updating so rapidly, the Design Builder shall meet with the Department TMC Engineers to inquire about the software currently being used to ensure Project conformity.

17.2.5 Meetings

The Design Builder shall meet at the request of the Department, as necessary, to discuss and resolve matters relating to ITS work during the design and construction stages. The requesting party shall provide the other parties with not less than five (5) days prior notice of such meetings. The Design Builder shall prepare and distribute a record of the minutes to the meeting within five (5) days.

17.2.6 Certification Requirements

The Design Builder shall perform all laboratory testing at a Department certified and approved lab and an AMRL-accredited facility for material tests required by this section. All material testers are to be certified for the materials they are testing.

17.2.7 Coordination with Other Agencies and Disciplines

The Department will assist in the coordination and resolution of all ITS issues with affected interests and regulatory agencies. The Design Builder shall document the resolutions of issues for the correspondence file, including meeting minutes and memoranda for the record. The Design Builder shall document the permit requirements and contacts with the permitting agencies.

17.2.8 Department Responsibilities

The Department responsibilities are as follows: Recommending Approval or disapproval of components and/or methods; Reviewing the documentation and certification of test device calibration (to ANSI specified guidelines which call for an annual calibration of test equipment) used to measure the following:

- Electrical characteristics of power and signal control cables.
- Insulation characteristics of power and signal control cables.
- Optical cable test equipment.

Making recommendations for the Approval of documentation, test results, and submittals. Reviewing and making recommendations for the Acceptance of the required documentation for the following items related to the system:

- Specifications.
- Shop drawings.
- Measured and recorded values.

Be present when the following ITS component locations are staked or flagged:

- Pull boxes
- CCTV Cameras and poles.
- Cabinets.
- Changeable message sign pole.

17.3 Design Requirements

17.3.1 ITS Concept Meetings

The Design Builder shall schedule and participate in ITS concept meetings to present layouts of the existing and proposed ITS system on the Project. The Design Builder shall be responsible for determining the number and location of all affected ITS elements. The Design Builder shall document this information, along with preliminary quantities. Existing ITS element sites shall be relocated to accommodate the roadway widening.

At the ITS concept meeting, the Design Builder shall present a functional ITS design with hardcopy layouts. The ITS concept meeting shall include proposed approaches for and discussion of the following topic areas:

- Preliminary plan for maintaining surveillance during construction
- Splice vault /Pull box locations
- Cabinet locations
- Locating ITS elements (traffic monitoring stations/count stations, CCTV cameras, changeable message signs, and highway advisory radio) and Maintenance Vehicle Pullouts (MVPs)
- Salvaged items
- Worker certifications
- Component testing (wire tests, loop detector testing)
- Test equipment calibration
- Documentation Temporary ITS elements
- Review ITS systems and operations, including field verification of all legacy ITS systems and elements
- Define and finalize ITS functional, technical, operational, and maintenance requirements
- Finalize goals and parameters of ITS design
- Establish integration requirements
- Develop Acceptance of ITS design
- Address and discuss ITS construction issues

The Design Builder shall submit the proposed Testing Plan. This meeting shall occur prior to any testing. Testing personnel, including the people that will be performing the field-testing shall be required to attend the meeting. The Design Builder shall notify the Department prior to F/O system testing. The Department may observe each test.

17.3.2 General Requirements

The ITS design shall provide for, real-time National Television System Committee (NTSC) closed circuit television (CCTV) surveillance, operations data collection (loop detection), and motorist information features. The Design Builder shall provide a complete, operational, and maintainable ITS systems and/or components. These systems and/or components shall be compatible with the in-place legacy system. The Design Builder shall label the ITS devices with the Department provided naming and numbering convention. The Design Builder shall provide an ITS design that meets, at a minimum, the following requirements:

- Expandability
- Consistent cabinet layouts throughout field device locations
- Support stand-alone operation of all field devices using backup software components
- Protection from voltage surges and lightning
- Weather-resistant elements capable of operating in rain and wind conditions and in temperature and humidity ranges encountered in the Project area
- ITS elements that are considered as the fixed objects should be installed outside the clear zone. The Design Builder shall design all temporary roadway facilities to comply with the same design and construction requirements as that of the permanent roadway facilities.
- If ITS elements being considered as the fixed objects cannot be installed beyond the clear zone, they shall be constructed and protected per AASHTO Roadside Design Guide, Department HDM and Department Standard Plans.

- At a minimum, a Maintenance Vehicle Pullout (MVP) per the Department *Standard Plans* shall be constructed adjacent to each site of ITS components such as the controller cabinets for CCTV Camera, Changeable Message Sign, and Traffic Monitoring Station Count Station, and the poles of CCTV Camera. Wherever possible, a MVP should be installed.

The Design Builder shall use stainless steel mounting hardware (e.g., bolts, nuts, washers, and external hinges) on vaults, cabinets, shelters, and other outdoor ITS devices. The Design Builder shall use only components designed for 20 or more years of industrial use. All material, equipment, and component parts furnished shall be new (within 12 months from date of manufacture), of the latest design and manufacture, in an operable condition at the time of delivery and installation, and compatible with the in-place system.

17.3.2.1 Transportation Management Center (TMC)

The District 6 TMC's primary purpose is to integrate the Department's District Maintenance Dispatch and the Department's Division of Operations with the California Highway Patrol Dispatch into a unified command center. The integration provides the communications and computer infrastructure necessary for coordinated transportation management on freeways during normal commuting periods, as well as during special events and major incidents. The District 6 TMC serves as a central point for collecting, verifying, processing, and distributing real-time transportation information throughout the District Project area. Information will be collected using various ITS components, including such roadside devices as closed circuit television cameras, traffic monitoring stations/count stations, changeable message signs, and highway advisory radio.

The data signals received at the District 6 TMC shall be configured to be integrated with the existing ATMS system processing hardware and software to enable operators to communicate with any CCTV camera, changeable message sign, traffic monitoring station (count stations), or ramp metering on the corridor and without affecting the existing system.

17.3.2.2 [NOT USED]

17.3.3 [NOT USED]

17.3.4 Permanent Traffic Surveillance

17.3.4.1 Closed Circuit Television (CCTV) System

17.3.4.1.1 Closed Circuit Television (CCTV) camera

The Design Builder shall furnish and install new CCTV hardware at locations. CCTV hardware shall be placed such that the intersecting arterial is viewable and maintenance access is available.

The Design Builder shall consult on the placement of CCTV hardware during the design progress meetings. Camera views, accessibility, and maintainability are issues of concern and the Design Builder shall obtain input from for approval.

The Design Builder shall provide a CCTV system that meets the following requirements:

- New CCTV camera equipment
- MVP or Caltrans Standard adjacent to the CCTV pole
- Cabling
- Coverage to remotely monitor highway and/or connecting arterial street traffic conditions and confirm messages displayed on changeable message signs within Project area
- Placement to allow monitoring of ramp metering and ramp queues, where applicable
- Maintenance-free, to the extent possible

- Poles and cameras shall not be placed in the median of the highway
- CCTV system shall be compatible with the current video switch in the Hub buildings.
- Lightning and surge protection

The Design Builder to determine new camera locations based on proximity to existing cameras affected by construction activity. The Design Builder shall make a 5-minute video of the field review at the proposed location/height of all CCTV cameras. The video shall demonstrate the camera's ability to zoom in and out and pan up and down. The video shall be reviewed to approve or disapprove the location and mounting height as applicable.

Work shall consist of furnishing and installing the following

- A CCTV camera assembly on a standard CCTV pole,
- Camera control circuits and accessories,
- CCTV wiring, including connectors, composite video cables, connectors and coaxial cables,

The CCTV camera assembly shall be supplied as a fully-assembled, integrated, tested and configured single unit from the manufacturer at the camera manufacturer facility and shall be delivered to the project site accompanied with a written certification of assembly and configuration from the camera manufacturer. This certification shall serve as the manufacturer documentation that the assembly and configuration of the camera/lens/housing equipment were performed. A sample certification document shall be furnished as part of the materials submittal data. CCTV Camera Assembly Communications Specifications:

- Serial data communications ports conforming to EIA/TIA-232 and EIA/TIA-422
- Configurable to support NTCIP 1205 - NTCIP Objects for CCTV Camera Control
- Via the CCTV protocol, the user shall be able to obtain camera position information including tilt angles, pan positions and zoom levels. The information shall be supplied as 0-359° Azimuth and -95° to +95° Elevation

Before installation and after installation, the Design Builder shall test to verify that all new CCTV camera assembly equipment functions in accordance with the manufacturer's specifications. After installation, new CCTV camera equipment shall be tested at each individual location. The Design Builder shall install and fully adjust the CCTV camera assembly with the associated components, power supply, and all necessary cabling and incidental equipment to make the CCTV camera assembly completely operational. All CCTV camera assembly components shall be fully interchangeable. All CCTV camera equipment installed shall be warranted for a minimum of 1 year from time of final acceptance test, or 2 years from date of delivery, whichever is longer. The period of warranty coverage shall not be less than the manufacturer's warranty period.

17.3.4.1.2 CCTV Poles

The Design Builder shall furnish and install CCTV poles for all the relocated CCTV camera sites.

17.3.5 Traveller Information

17.3.5.1 Changeable Message Signs (CMS)

The Design Builder shall determine when an existing Changeable Message Sign (CMS) is affected by construction activity and relocate the affected CMS system to the new location as required on this project. The Design Builder shall furnish and install necessary equipment for all CMS's to make the system fully operational.

17.3.5.2 [NOT USED]

17.3.6 [NOT USED]

17.3.7 [NOT USED]**17.3.8 Grounding**

The Design Builder shall ensure that all equipment, devices, interconnect wiring, communication devices, communication lines, power supplies, antennas, operator controls, and power service are protected from external and internal sources, including power surges, lightning, induced voltages, and static discharge. All cables shall be UV stable. The Design Builder shall design a grounding system and protection devices suitable for the specific installation and equipment being supplied.

17.3.8.1 [NOT USED]**17.3.8.2 Electrical Service**

Unless otherwise specified, the Design Builder shall provide 120v/240v electrical power to each location as necessary. The Design Builders shall be responsible for the application for electrical service and all costs associated with utility hook-up charges and components installed by the utility company.

17.3.8.3 Coordination with Power Utility

The Design Builder shall coordinate with the Utility to request to shut off or turn on the service during construction period if needed. Design Builder shall be responsible for obtaining new or modified electrical service points, including all applications and permits required from the serving utility company. Separate service conduits shall be used for Traffic Monitoring Systems (TMS), Ramp Metering Systems (RMS), CCTV cameras, and from the service meter cabinet to the load. Electrical service cabinets shall be placed off the freeway. Design Builder shall be responsible for all electrical Utility costs following any change in loading on an existing meter, or installation of a new meter. This responsibility shall continue until Final Acceptance.

17.4 Construction Requirements

The Design Builder shall design the ITS system as a whole and receive Approval before installation of any individual field element. The Design Builder shall make final connections of the newly installed or temporary ITS elements to the existing system. Three Working Day advanced notification to the Department is required prior to staking locations for ITS devices and shall obtain approval prior to start of any work related to the installation of any ITS devices. Upon completion of installation of all ITS devices, a final walk through is required to ensure functional, continuity and connectivity requirements are met. Confirmation that all newly constructed/installed ITS devices (loops, CMS, CCTV and others) and connectivity to the existing ITS systems are working properly is required prior to relief of maintenance.

17.4.1 General Requirements

The Design Builder shall provide an advance notice to the Department of installation of CCTV hardware, cabinets, and equipment. The Design Builder shall provide *x, y, z* coordinates on the installed ITS elements and on existing elements where the new elements connect to them:

- Loop detectors
- Pull boxes
- Control cabinets
- CCTV Camera poles

The Design Builder shall also provide coordinate correct As-Built drawings. The As-Built drawings shall use the Released for Construction design drawings used for construction with all deviations of components from their original design placements redrawn and shown in their coordinate correct location. As-Built drawings shall contain standard line styles and component

symbols used for ITS design. Construction shall be in accordance with the requirements of the Standard Specifications and the Special Provisions.

17.4.1.1 Allowable Working Hours on the ITS System

All ITS elements outside the Planned Right of Way limits shall not be affected by the Design Builder and remain operable during construction of the Project. The Design Builder shall be restricted to only work on the active part of the system from 9:00 a.m. to 3:00 p.m. and 7:00 p.m. to 6:00 a.m. Notification from the Design Builder shall be required prior to taking down active system elements. The Design Builder shall perform all work in a manner ensuring the integrity and proper performance of all ITS elements during these hours. A 48 hours notification is required prior to performing any work on existing/active ITS devices.

17.4.1.2 Repair Parts

The Design Builder shall have repair parts available during construction for all ITS elements.

17.4.1.3 Materials and Fabrication

The Design Builder shall round and smooth sharp corners and edges on all ITS elements that are furnished and installed.

17.4.1.4 Locates

The Design Builder shall be responsible for all underground cables placed by the project until Final Acceptance of the project.

17.4.2 [NOT USED]

17.4.3. Closed Circuit Television (CCTV) System

The Design Builder shall furnish and install the CCTV hardware. Notification from the Design Builder shall be required when the installation of the CCTV hardware is complete. The Department shall work with the Design Builder and be present to approve the locations for the CCTV pole foundation and the 334 TV cabinets in the field before the foundations are placed. Design Builder will furnish and install the CCTV camera assemblies at each of the CCTV hardware locations.

17.4.3.1. Video/Control Cable for Camera

The Design Builder will furnish and install the camera video/control/power combination cable from the CCTV pole box to the top of the pole. All CCTV shall be installed behind a protective barrier. The Design Builder shall provide a flat pull strap within the CCTV pole to facilitate installation of the CCTV communication/video/power combination cable from the CCTV pole box to the top of the pole.

17.4.3.2 CCTV Pole Foundation

The Design Builder shall furnish and install foundations for CCTV poles that comply with the Department *Standard Plans, May 2006*, Sheet ES-16A.

17.4.3.3 Maintenance Vehicle Pull Out Adjacent to CCTV Camera Site

The Design Builder shall construct a maintenance vehicle pull out at each CCTV camera site. The Design Builder shall locate a 1-meter (3-foot) by 1-meter (3-foot) by 0.100-meter (4-inch) sidewalk under the CCTV pole crank opening and another under the CCTV cabinet location

17.4.3.4 Salvage Components

The Design Builder shall salvage all CCTV camera assemblies and CCTV poles removed for construction purposes.

17.4.3.5 Loop Detectors for TMS/CS

Exact locations for all loop stations shall be determined in the final design phase of the Project. A loop detector station shall be placed as close to the existing locations. These mainline stations shall be “count loop” detection with a single set of loops for all mainline roadway lanes. When installing queue detection loops, the Design Builder shall evaluate the site conditions. Approval is required if the distance from the ramp meter varies more than 16.4 feet.

Splicing an Existing Lead-in Cable to a New Detector Loop

The Design Builder shall verify that existing loop identification markings (lane and cabinet identification) are correct prior to cutting the splice to the lead-in cable. The Design Builder shall splice the existing lead-in cable to the new detector loop. The Design Builder shall provide a notification following the installation of the splice.

Testing and Setting Up the Loop Detector Installation

The Design Builder shall set up the loop detector card. The Design Builder shall be responsible for notifying when the loop and lead-in wire are ready for termination and testing.

Terminating Lead-in Wires in the Cabinet

Detector loop lead-in cables shall be terminated on the compression terminal block in the control cabinet. The Design Builder will terminate the loop lead-in cable.

17.4.4 Communication Network

The Design Builder shall furnish and install materials and equipment such that ITS communications components are composed of identical sub-components. Identical sub-components shall be defined as components of the same manufacturer, model, and installation configuration. The ITS communications sub-components include the following:

- wireless Modems

All locations containing identical equipment shall be configured and wired in a consistent if not identical manner by the Design Builder, including internal wiring and harnesses, wiring color codes, labeling terminal block positions, termination strips, power service configuration, and panel and equipment mounting and locations.

17.4.4.1 Proposed and Existing Fiber Optic Cable

Exercise caution and excavate by hand or by utilizing a vacuum excavator when exposing an existing F/O cable.

17.4.4.2 [NOT USED]

17.4.4.3 [NOT USED]

17.4.4.4 [NOT USED]

17.4.4.5 [NOT USED]

17.4.4.6 [NOT USED]

17.4.4.7 [NOT USED]

17.4.4.8 Coaxial Cable

The Design Builder shall not use coaxial cable, other than when the Design Builder determines it is necessary and approves.

17.4.5 Traveler Information

17.4.5.1 Changeable Message Signs

The Design Builder shall relocate the existing changeable message signs when they are necessary. The Design Builder shall be responsible to determine the new locations for the relocated changeable message signs and design to make the systems functional and operational.

17.4.5.2 [NOT USED]

17.4.6. [NOT USED]

17.4.7 Single Point Grounding

For all electrical and electronic grounding, the Design Builder shall meet single-point grounding requirements. Single-point grounding means referencing all grounded devices to a single point (one single piece ground rod) via the shortest and straightest route. The Design Builder shall collect the devices' chassis and electrical grounds at a ground buss before connecting them to the earth ground rod. The Design Builder shall connect the ground busses via conductors that meet the requirements of single point grounding. For single-point grounding, the Design Builder shall perform the following:

- Ground all equipment to meet the requirements of the manufacturer.
- Route each ground conductor to the ground buss via the straightest route that does not hinder maintenance or installation activities.
- Use a sheath grounding unit to ground the outer shield and armor of the fiber-optic cables in control cabinets to the equipment ground bus.
- Clean each grounding component with 300-grit emery cloth before bonding and apply a mineral-oil-based oxide inhibitor to the bond area.

17.4.7.1 Ground Rods and Ground Rod Connections

The Design Builder shall furnish and install ground rods and ground rod connections with the following requirements: The ground rod shall be 4.6 m (15 feet) long, one piece, and comply with the Department Standard Specifications. An oxide inhibitor shall be applied over bonded connections to ground rods. The Oxide Inhibitor shall

- be UL listed
- provide an airtight seal around the conductor and ground rod,
- be applied to the bonded area between the temperatures of -22 °C (-30 °F) and 149 °C (300 °F),
- be used on copper conductors,
- prevent oxides from forming, and
- be mineral oil based

The Design Builder shall bond the ground conductor to the ground rod by one of the following three bonding methods:

- Compression.
- Exothermic Welding is used when grounding TMS Shelters, CCTV poles and CMS structures with lightning braid.
- Irreversible compression is used when grounding TMS Shelters, CCTV poles and CMS structures with lightning braid. The irreversible compression bond is achieved by:

- Using a hydraulic press with a connector die.
- Using a solid copper connector with a run for a 5/8 inch ground rod and a tap for the specified ground conductor.

- Using connectors that can accommodate a conductor range from No. 6 solid copper through 500 Kcmil, are pre-filled with an antioxidant compound, and are strip sealed.

The Design Builder may propose other methods and materials for implementing an irreversible compression bond and submit the associated products and procedures of equal quality for Approval.

17.4.8 Conduit

The Design Builder shall immediately cap all open ends of installed conduit until cables are installed. “Abandon conduit” shall mean the Design Builder removes the abandoned cables. Standard bell ends shall be installed on all conduit ends by the Design Builder to prevent damage to the installed cable.

17.4.8.1 Existing Conduit Systems

Existing conduit systems may consist of PVC, polyethylene, continuous polyethylene, or RSC.

17.5 Deliverables

17.5.1 ITS Plan Submittals

The Design Builder shall provide five hardcopies and one electronic copy of Released for Construction documents at least three days prior to each ITS design progress meeting. The Design Builder shall submit the Fiber-Optic System Test Plan for Approval.

17.5.1.1 Over-the-Shoulder Design Documents

During the design process, any submittals required in the Design Standards or other Contract Documents shall be prepared by the Design Builder and submitted to the Department. Submittals shall be in a format acceptable and organized to facilitate review. It shall be the responsibility of the Design Builder to coordinate to insure that the structure of the submittals is satisfied.

17.5.1.2 Released for Construction (RFC) Documents

The Design Builder shall produce plans and specifications in a format that aids and facilitates design review and provide adequate information for safe, efficient, and high-quality construction. Plan sets and sheet types shall be developed in accordance with the Department *CADD Standards*, the Department *Plans Preparation Manual*, and the Design Quality Management Plan before construction may begin.

17.5.1.2.1 Plans

The following list of RFC plans, which is not an all inclusive list, shall be produced:

- Title sheet
- Legend of symbols
- Existing ITS elements with utilities
- Proposed ITS devices with GPS locations
- ITS sample plan symbology
- Typical section view
- Communication schematics
- Test schematics
- ITS element details
- Quantity tabulations

17.5.1.3 ITS element, Test, and Project Documentation

The Design Builder shall prepare and submit ITS element, test, and Project documentation. The test documentation shall include completed forms and electronic documentation. Two sets of ITS element and test documentation shall be submitted for Acceptance. Two sets of ITS element documentation shall be required. The Design Builder shall complete and submit the inspection checklists. The Design Builder's Traffic Engineer shall sign off on all forms. The Design Builder shall obtain Acceptance of the ITS element submittal package before installation of the ITS elements is Approved. Notification by the Design Builder is required when all ITS requirements have been met. Contract work will be accepted after verifying proper operation of all components. The Design Builder shall submit the proof of performance (POP) test results following the completion of the POP tests for Acceptance. The Design Builder shall submit specifications for the following: Loop assembly, loop lead-in, loop conductor, and the splice encapsulator. Acceptance of each submittal is required before the installation of the ITS element will be authorized. The Design Builder shall submit the loop detector test report within one week after completing installation for loops. The Design Builder shall submit all wiring diagrams for review and incorporate comments resolved in the wiring diagram. The Design Builder shall submit power and control cable test results within 7 days of making final connections.

17.5.1.3.1 Fiber-Optic Cable Test Documentation

17.5.2 Final Design Documents

The Design Builder shall submit final design documents when final design is complete, including office and field generated design changes. Final design documents include:

- Plans
- Shop drawings
- Design calculations
- Reports/Project documentation
- Specifications and Special Provisions

17.5.2.1 Non- Standard Specifications and Non-Standard Special Provisions (NSSP)

If the Design Builder requests Approval to Specifications and Provisions that are not Department standards, such request shall include comprehensive specifications and provisions associated with the proposed non-standard methods or materials. The NSSP approval process for ITS NSSPs requires a minimum of four weeks for review and approval notwithstanding review and approval at the IPO.

17.5.2.2 As-Built Documents

Upon completion of the Project and before Final Acceptance, the Design Builder shall deliver a complete set of as-built documents and design files that incorporate all design changes and details of Accepted Work that occurred throughout the Project. As-Built Documents must be submitted in both hardcopy and electronic form. The As-Built Documents shall meet the format and content requirements of Final Design Documents. The Design Builder shall sign, seal and date the title sheet of the As-Built Documents to certify that the Work was completed in accordance with the plans, the Contract Documents, the Governmental Approvals and applicable Law

18 MAINTENANCE OF TRAFFIC

18.1 General

The Design-Builder shall perform all Work necessary to meet the requirements associated with Maintenance of Traffic (MOT) in accordance with the requirements of the Contract Documents and these Technical Provisions. This work includes, but is not limited to, providing for the safe and efficient movement of people, goods, and services around the Project while minimizing impacts to residents, commuters, and businesses.

18.2 Administrative Requirements

18.2.1 Standards

The Design Builder shall perform the Work in accordance with the requirements of the standards listed by priority below.

If there is any conflict in standards, adhere to the standard with the highest priority. However, if the Design-Builder's submittal has a higher standard than any of the listed standards, adhere to the submittal standard.

If there is any unresolved ambiguity in standards, it is the Design-Builder's responsibility to obtain clarification from the Department before proceeding with design and/or construction.

Use the most current version of each listed standard as of the initial publication date of this RFP unless modified by Addendum or Change Order.

Maintenance of Traffic Standards and Requirements

Priority	Agency	Title
1	Department	Transportation Management Plan (TMP) Guidelines
2	Department	Technical Memoranda
3	Department	California Manual on Uniform Traffic Control Devices
4	Department	Standard Special Provisions
5	Department	2006 Revised and New Standard Plans
6	Department	Standard Plans May 2006
7	Department	Design-Build Modifications to the Standard Specifications
8	Department	Standard Specifications*
9	Department	Highway Design Manual*
10	Department	Plans Preparation Manual
11	Department	CADD User Manual
12	AASHTO	A Policy on Geometric Design of Highways and Streets,
13	AASHTO	Roadside Design Guide, 3 rd Edition
14	Department	Ramp Meter Design Manual

*Document modified for design-build.

18.2.2 References

Use the references listed below as supplementary guidelines for Maintenance of Traffic. These publications have no established order of precedence.

Maintenance of Traffic References

Agency	Title
AASHTO	Roadside Design Guide
TRB	Highway Capacity Manual

18.2.3 Traffic Management Plan

The Design-Builder shall develop, implement, and maintain a Traffic Management Plan (TMP) that includes the following items:

- Descriptions of the duties of the Traffic Engineering Manager, Traffic Control Supervisor and other personnel with MOT responsibilities.
- A Traffic Management Plan Checklist completed under the direction of the Traffic Engineering Manager. See Exhibit 18-A.
- Procedures to identify and incorporate the needs of emergency service providers, law enforcement entities, local governments and agencies, and other related corridor users.
- Procedures to address special circumstances such as equipment malfunctions, traffic incidents, and special events.
- Procedures to modify the TMP as needed to adapt to current Project circumstances.
- Procedures to communicate TMP information to the Design-Builder's public information personnel, the Department's Public Information Office, and notify the public of Maintenance of Traffic issues in conjunction with the requirements of Book 2, Section 3.

18.2.4 MOT Task Force

18.2.4.1 Membership

The Design-Builder shall establish a MOT task force, inviting representatives of the Design-Builder, the Department, Cities, Counties, law enforcement agencies, emergency response providers, and other agencies whose operations affect or are affected by the Project MOT plans.

18.2.4.2 Meetings

The Design-Builder shall schedule and chair MOT task force meetings once a month from NTP2 to Project completion. The meeting schedule and frequency may be adjusted upon the agreement of the MOT task force members. The purpose of the meetings shall be to:

- Review and refine the TMP and its implementation.
- Review and refine the Design-Builder's MOT plans, specifications, and details,
- disseminate MOT information to task force meeting attendees,
- Determine additional membership invitees affected by the MOT as needed.

The Design-Builder shall deliver to the Department a list of all parties invited to take part in the MOT task force and the responses to all the invitations. The Design-Builder shall also take

meeting minutes and distribute them to the task force members within 3 working days of the meeting.

18.3 Design Requirements

The Design-Builder shall use the procedures in the TMP to develop plans, specifications, and details to address all construction related traffic control issues. This includes construction area signs, stage construction, traffic handling, and detours.

18.3.1 Project Specific Requirements

The Design-Builder shall develop and incorporate the Lane Closure Charts in accordance with the guidelines provided by the Department (see Exhibit 18-A). The accepted Lane Closure Charts or any revisions to the accepted Lane Closure Charts, or additional Lane Closures Charts required, shall be submitted to the Department for concurrence. The Department will have 5 Working Days to review the request.

The Design-Builder shall incorporate the detour routes as required for on-ramp closures in the development of final Detour Plans. The accepted detour routes, or any revisions to the accepted detour routes, or additional detours required, shall be submitted to the Department for concurrence. The Department will have 5 Working Days to review the request. It is the Design-Builder's responsibility to contact and obtain approval from local agencies for detours on roads or streets under their jurisdiction.

The Design-Builder shall provide Sign Details plans showing how to fabricate any sign not detailed in the CA MUTCD. This includes sign dimensions, message, lettering sizes, and colors.

18.3.2 Haul Roads

The Design-Builder must have its haul roads pre-approved by the appropriate governing agency. The Design-Builder shall be responsible for maintenance of haul roads during construction and restoration of haul roads to levels specified by the appropriate governing agency.

18.3.3 Pedestrian Access and Trails

The Design-Builder shall maintain pedestrian access on all sidewalks, trails, and intersections along all streets as much as possible. If access cannot be maintained, the Design-Builder shall obtain Approval from the Department and the appropriate governing agency to close or modify the pedestrian access and shall furnish and install proper signing for pedestrians.

The Department and other appropriate governing agencies shall be notified 10 Working Days prior to the closure, and advanced signing shall be provided notifying all users of the closure. This signing shall be erected a minimum of five (5) prior to the closure and shall note the closure duration.

18.3.4 Temporary Mainline Crossovers

Temporary mainline crossovers shall be designed and constructed for single lane in each direction, in accordance with the following criteria:

- Minimum design speed: 45 mph
- Minimum width of paved driving surface: 18 feet
- Minimum width of aggregate shoulder on each side of the traveled way: 3 feet
- Design curves: 4 degrees
- Infield slope: no steeper than 1:4 (v:h)

- Temporary crossovers must be located outside the area of an entrance or exit ramp that is open to traffic by a minimum of:
 - 800 feet from the end of the taper on an entrance ramp
 - 400 feet from the end of the taper on an exit ramp

18.3.5 Temporary Auxiliary Lanes and Exit Ramp Extensions

Temporary lanes and extensions for exit ramps shall be designed and constructed to meet the following requirements:

- Exiting traffic must not have to slow down in the through lanes to less than 50 mph in order to safely gain access to the temporary auxiliary lane.
- The temporary auxiliary lane must be long enough so that traffic leaving the through lane at 50 mph can slow down safely to a speed of 30 mph.
- The temporary auxiliary lane shall have a paved surface width of at least 12 feet and an aggregate shoulder width of at least 3 feet.
- Temporary bypass extensions shall have a paved surface width of at least 16 feet and an aggregate shoulder width of at least 3 feet on both sides.
- The infield slope shall not be steeper than 1:4 (v:h).
- Acceleration lanes shall be designed to meet the standards shown in the *Highway Design Manual*.
- All temporary auxiliary lanes and extensions for exit ramps shall be provided with temporary overhead lighting.
- A minimum 2-foot reaction distance shall be provided for any temporary or permanent barrier device, including portable temporary concrete barrier.
- The Design-Builder shall install the final signing and pavement markings required to safely open the road to traffic. This Work shall be completed on or before the date of opening.

18.3.6 Temporary Guardrail, Barrier, Attenuators, and Glare Screen

The Design-Builder shall be responsible for using temporary guardrail or barrier and attenuators to protect the traveling public from the following:

- Fixed objects within the clear zone
- Drop-offs that are not in accordance with the traffic control treatment of longitudinal joint and edge drop-off guidelines in the Department Field Manual for Temporary Traffic Control Zone Layout
- Slopes steeper than 1:4 (v:h)

18.4 Construction Requirements

The Design-Builder shall be responsible for all Project Maintenance of Traffic starting at 12:01 a.m. on the Day work begins on the Project. All traffic control devices must be continually and adequately monitored and maintained to ensure proper placement and the safe and efficient flow of all construction traffic into and out of the Project. Such responsibility and maintenance shall continue until 11:59 p.m. on the Day of Substantial Completion of the Project and when such traffic control devices are no longer required as determined by the Department. The Department

may, in writing, temporarily suspend such responsibility in conjunction with an official suspension for weather or other reasons.

18.4.1 Construction Area Traffic Control Devices

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

Category 1 temporary traffic control devices are defined as small and lightweight (less than 100 pounds) devices. These devices shall be certified as crashworthy by crash testing, crash testing of similar devices, or years of demonstrable safe performance. Category 1 temporary traffic control devices include traffic cones, plastic drums, portable delineators, and channelizers.

If requested by the Department, the Design-Builder shall provide written self-certification for crashworthiness of Category 1 temporary traffic control devices at least 5 days before beginning any work using the devices or within 2 days after the request if the devices are already in use. Self-certification shall be provided by the manufacturer or Design-Builder and shall include the following:

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

The Design-Builder may obtain a standard form for self-certification from the Department.

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

Category 2 temporary traffic control devices shall be on the Federal Highway Administration's (FHWA) list of Acceptable Crashworthy Category 2 Hardware for Work Zones. This list is maintained by FHWA and can be located at:

http://safety.fhwa.dot.gov/roadway_dept/policy_guide/road_hardware/listing.cfm?code=workzone

The Department also maintains this list at:

<http://www.dot.ca.gov/hq/traffops/signtech/signdel/pdf/Category2.pdf>

Category 2 temporary traffic control devices that have not received FHWA acceptance shall not be used. Category 2 temporary traffic control devices in use that have received FHWA acceptance shall be labeled with the FHWA acceptance letter number and the name of the manufacturer. The label shall be readable and permanently affixed by the manufacturer. Category 2 temporary traffic control devices without a label shall not be used.

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

Category 3 temporary traffic control devices consist of temporary traffic-handling equipment and devices that weigh 100 pounds or more and are expected to produce significant vehicular velocity change to impacting vehicles. Temporary traffic-handling equipment and devices include crash

cushions, truck-mounted attenuators, temporary railing, temporary barrier, and end treatments for temporary railing and barrier.

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

Category 3 temporary traffic control devices shall be shown on the plans or on the Department's Highway Safety Features list. This list is maintained by the Division of Engineering Services and can be found at:

http://www.dot.ca.gov/hq/esc/approved_products_list/

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

18.4.2 Maintaining Traffic

Maintaining traffic shall conform to the provisions in Sections 7-1.08, "Public Convenience," Section 7-1.09, "Public Safety," and Section 12, "Construction Area Traffic Control Devices," of the Caltrans Standard Specifications and these Technical Provisions.

Closure is defined as the closure of a traffic lane or lanes, including shoulder, ramp or connector lanes, within a single traffic control system.

Closures shall conform to the provisions in "Traffic Control System for Lane Closure" of these Technical Provisions.

Closures shall conform to the accepted closure charts developed by the Design-Builder (see Exhibit 18-A).

Work that interferes with public traffic shall be limited to the hours when lane closures are allowed, except for work required under Sections 7-1.08, "Public Convenience," and Section 7-1.09, "Public Safety," of the Standard Specifications.

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

Special days are: the third Monday in January.

The maximum length of a single stationary lane closure shall be 1/3 mile.

Not more than one (1) separate stationary lane closures will be allowed in each direction of travel at one time.

Local authorities shall be notified at least five (5) business days before work begins. The Design-Builder shall cooperate with local authorities to handle traffic through the work area and shall make arrangements to keep the work area clear of parked vehicles.

Adjacent ramps, in the same direction of travel, servicing two (2) consecutive local streets shall not be closed simultaneously unless directed by the Department.

SC6-3(CA) (RAMP CLOSED) sign shall be used to inform motorists of the temporary closing of a connector, entrance ramp or exit ramp for 1 business day.

SC6-4(CA) (RAMP CLOSED) sign shall be used to inform motorists of the temporary closing of a connector, entrance ramp or exit ramp for more than 1 business day.

The SC6-3(CA) or SC6-4(CA) signs shall be installed at least 7 days before closing the connector or ramp, but not more than 15 days before the connector or ramp closure. The Design-Builder shall notify the Department at least 2 business days before installing the SC6-3(CA) or SC6-4(CA) signs.

Accurate information shall be maintained on the SC6-3(CA) or SC6-4(CA) signs. The SC6-3(CA) or SC6-4(CA) signs, when no longer required, shall be immediately covered or removed.

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

When work vehicles or equipment are parked within 6 feet of a traffic lane to perform active construction, the shoulder area shall be closed with fluorescent orange traffic cones or portable delineators placed on a taper in advance of the parked vehicles or equipment and along the edge of the pavement at 25-foot intervals to a point not less than 25 feet past the last vehicle or piece of equipment. A minimum of 9 traffic cones or portable delineators shall be used for the taper. A W20-1 (ROAD WORK AHEAD) or W21-5b (RIGHT/LEFT SHOULDER CLOSED AHEAD) or C24(CA) (SHOULDER WORK AHEAD) sign shall be mounted on a crashworthy portable sign support with flags. The sign shall be placed where designated by the Department. The sign shall be a minimum of 48" x 48" in size. The Design-Builder shall immediately restore to the original position and location a traffic cone or delineator that is displaced or overturned, during the progress of work.

If minor deviations from the lane requirement charts are required, a written request shall be submitted to the Department at least 15 days before the proposed date of the closure. The Department may approve the deviations at its sole discretion if the work can be expedited and better serve the public traffic.

Lane Closure Restriction for Designated Legal Holidays and Special Days										
Thu	Fri	Sat	Sun	Mon	Tues	Wed	Thu	Fri	Sat	Sun
x	H xx	xx	xx							
	SD xx									
x	xx	H xx	xx							
		SD xx								
	x	xx	H xx	xx						
			SD xx							
	x	xx	xx	H xx	xxx					
	x	xx	xx	SD xx	xxx					
				x	H xx					
				x	SD xx					
					x	H xx				
						SD xx				
						x	H xx	xx	xx	xx
							SD xx			
Legends:										
	Refer to lane closure charts									
x	The full width of the traveled way shall be open for use by public traffic after <u>7:00 AM</u> .									
xx	The full width of the traveled way shall be open for use by public traffic.									
xxx	The full width of the traveled way shall be open for use by public traffic until <u>6:00 PM</u> .									
H	Designated Legal Holiday									
SD	Special Day									

18.4.3 Closure Requirements and Conditions

Closures shall conform to the provisions in "Maintaining Traffic" and these Technical Provisions.

18.4.3.1 Closure Schedule

A written schedule of planned closures for the next week period, defined as Sunday noon through the following Sunday noon, shall be submitted by noon each Monday. A written schedule shall be submitted not less than 25 days and not more than 125 days before the anticipated start of any operation that will:

1. Reduce horizontal clearances, traveled way, including shoulders, to two lanes or less due to such operations as temporary barrier placement and paving
2. Reduce the vertical clearances available to the public due to such operations as pavement overlay, overhead sign installation, or falsework or girder erection

The Closure Schedule shall show the locations and times of the proposed closures. The Closure Schedule request forms furnished by the Department shall be used. Closure Schedules submitted to the Department with incomplete or inaccurate information will be rejected and returned for correction and resubmittal. The Design-Builder will be notified of disapproved closures or closures that require coordination with other parties as a condition of approval.

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

The Department shall be notified of cancelled closures 2 business days before the date of closure. Failure to notify the Department of cancelled closures by the Design-Builder may result in a fine of \$300 per unreported cancelled closure.

Closures that are cancelled due to unsuitable weather may be rescheduled at the discretion of the Department.

18.4.3.2 Contingency Plan

A detailed contingency plan shall be prepared for reopening closures to public traffic. The contingency plan shall be submitted to the Department within one business day of the Department's request.

18.4.3.3 [NOT USED]

18.4.3.4 Denied Closures

The Department shall be notified of delays in the Design-Builder's operations due to the following conditions, and if, in the opinion of the Department, the Design-Builder's controlling operation is delayed or interfered with by reason of those conditions, an extension of time will be granted to the Design-Builder and no additional compensation will be made by the Department:

1. The Design-Builder's proposed Closure Schedule is denied and his planned closures are within the time frame allowed for closures in "Maintaining Traffic" of these Technical Provisions.
2. The Design-Builder is denied a confirmed closure.
3. The Department directs the Design-Builder to remove a closure before the time designated in the approved Closure Schedule.

18.4.4 Impact Attenuator Vehicle

18.4.4.1 General

Work includes protecting traffic and workers by using impact attenuator vehicle as a shadow vehicle when placing and removing components of a traffic control system, and when performing a moving lane closure.

Comply with Section 12-3.03, "Flashing Arrow Signs," of the Standard Specifications.

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

1. Test level 3 for pre-construction posted speed limit of 50 mph or more
2. Test levels 2 or 3 for pre-construction posted speed limit of 45 mph or less

Comply with the attenuator manufacturer's recommendations for:

1. Support truck

2. Trailer-mounted operation
3. Truck-mounted operation

Definitions

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

Submittals

Upon request, submit a Certificate of Compliance for attenuator to the Department under Section 6-1.07, "Certificates of Compliance," of the Standard Specifications.

Quality Control and Assurance

Attenuator must be a brand listed on the Department's pre-approved list under Highway Safety Features at:

http://www.dot.ca.gov/hq/esc/approved_products_list/

18.4.4.2 Materials

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

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

Each impact attenuator vehicle must:

1. Have standard brake lights, taillights, sidelights, and turn signals
2. Have an inverted "V" chevron pattern placed across the entire rear of the attenuator composed of alternating 4 inch wide non-reflective black stripes and 4 inch wide yellow retroreflective stripes sloping at 45 degrees
3. Have a Type II flashing arrow sign
4. Have a flashing or rotating amber light
5. Have an operable 2-way communication system for maintaining contact with workers

18.4.4.3 Construction

Use impact attenuator vehicle to follow behind equipment and workers who are placing and removing components of a traffic control system for a lane closure or a ramp closure. Flashing arrow sign must be operating in arrow mode during this activity. Follow at a distance to prevent intrusion into the workspace from passing traffic.

After placing components of a traffic control system for a lane closure or a ramp closure you may use impact attenuator vehicle in a closed lane and in advance of a work area to protect traffic and workers.

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

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

18.4.5 Traffic Control System for Lane Closure

A traffic control system shall consist of closing traffic lanes and ramps in conformance with the details shown on the plans, the provisions in Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications, the provisions under "Maintaining Traffic" and "Construction Area Signs" and these Technical Provisions.

The provisions in this section will not relieve the Design-Builder of responsibility for providing additional devices or taking measures as may be necessary to comply with the provisions in Section 7-1.09, "Public Safety," of the Standard Specifications.

During traffic stripe operations and pavement marker placement operations using bituminous adhesive, traffic shall be controlled, at the option of the Design-Builder, with either stationary or moving lane closures. During other operations, traffic shall be controlled with stationary lane closures. Attention is directed to the provisions in Section 84-1.04, "Protection From Damage," and Section 85-1.06, "Placement," of the Standard Specifications.

If components in the traffic control system are displaced or cease to operate or function as specified, from any cause, during the progress of the work, the Design-Builder shall immediately repair the components to the original condition or replace the components and shall restore the components to the original location.

18.4.5.1 Stationary Lane Closure

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

18.4.5.2 [NOT USED]

18.4.6 Portable Changeable Message Signs

18.4.6.1 General

Summary

Work includes furnishing, placing, operating, maintaining, and removing portable changeable message signs.

Comply with Section 12-3.12 "Portable Changeable Message Signs," of the Standard Specifications.

Definitions

Useable shoulder area: Paved or unpaved contiguous surface adjacent to the traveled way with:

1. Sufficient weight bearing capacity to support portable changeable message sign
2. Slope not greater than 6:1 (horizontal:vertical)

Submittals

Upon request, submit a Certificate of Compliance for each portable changeable message sign under Section 6-1.07, "Certificates of Compliance," of the Standard Specifications.

Quality Control and Assurance

Comply with the manufacturer's operating instructions for portable changeable message sign.

Approaching drivers must be able to read the entire message for all phases at least twice at the posted speed limit before passing portable changeable message sign. You may use more than 1 portable changeable message sign to meet this requirement.

Only display the message ordered by the Department or specified in these Technical Provisions.

18.4.6.2 Materials

The text of the message displayed on portable changeable message sign must not scroll, or travel horizontally or vertically across the face of the message panel.

18.4.6.3 Construction

Continuously repeat the entire message in no more than 2 phases of at least 3 seconds per phase.

If useable shoulder area is at least 15 feet wide, the displayed message on portable changeable message sign must be minimum 18-inch character height. If useable shoulder area is less than 15 feet wide, you may use a smaller message panel with minimum 12-inch character height to prevent encroachment in the traveled way.

You or your representative must be available by cell phone for operations that require portable changeable message signs. Give the Department your cell phone number. When the Department contacts you, immediately comply with the Department's request to modify the displayed message.

Start displaying the message on portable changeable message sign 5 minutes before closing the lane.

Place 1 portable changeable message sign in advance of the first warning sign for:

1. Each stationary lane closure
2. Each off-ramp closure
3. Each connector closure
4. Each shoulder closure

Place portable changeable message sign as far from the traveled way as practicable where it is legible to traffic and does not encroach on the traveled way. Place portable changeable sign before or at the crest of vertical roadway curvature where it is visible to approaching traffic. Avoid placing portable changeable message sign within or immediately after horizontal roadway curvature. Where possible, place portable changeable message sign behind guardrail or temporary railing (Type K).

Except where placed behind guardrail or temporary railing (Type K), use traffic control for shoulder closure to delineate portable changeable message sign.

Remove portable changeable message sign when not in use.

18.4.7 Pavement Markings During Construction

The Design-Builder shall inspect and replace all damaged or missing pavement markings daily.

The Design-Builder shall clean or replace all pavement markings when they become damaged or lose reflectivity.

The Design-Builder shall use equipment that is not detrimental to the roadway surface for removing pavement markings, as approved by the Department.

The Design-Builder shall replace or clean temporary pavement markings whenever the reflectivity of the markings has deteriorated to 80% or less of the value specified for the material when new. Reflectance values shall be measured in accordance with ASTM D4061. The Design-Builder shall perform the required tests monthly at 1-mile intervals or at specific locations requested by the Department.

18.4.8 Temporary Signalization

18.4.8.1 Electrical Service

The Design-Builder shall coordinate with the local power supplier to provide the electrical service connection for each temporary signal system. The Design-Builder shall pay the monthly electrical power costs of the temporary signal system.

18.4.8.2 Material Requirements

The Department will supply the signal controller cabinet and signal controller for temporary signal systems. The Department will install the signal controller for temporary signals.

The Design-Builder shall supply all required materials for the temporary signalization, except for the controller and controller cabinet. The Design-Builder shall install the signal controller cabinet for temporary signal systems. The Design-Builder shall be responsible for cabinet base construction and external wiring connections.

18.4.8.3 Department Inspection

The Design-Builder shall provide 24-hour notice to the Department prior to implementing temporary signal phasing. The Design-Builder shall provide vehicle detection methods to optimize all temporary signal system installations.

18.4.8.4 Operation and Maintenance

The Department will provide signal timing for temporary signals. The Department will enter the timing parameters into the signal controller. The Department will be responsible for the operation and maintenance of the signal controllers and signal controller cabinets for temporary signals.

The Design-Builder shall maintain all components of the temporary signal systems, except for the controllers and controller cabinets. The Design-Builder shall remove all temporary signal system installations upon completion and operation of the new permanent signal systems. The Design-Builder shall maintain all materials not maintained by the Department of the new and revised permanent signal systems from the first day of construction until Final Acceptance.

18.4.8.5 Salvage

The Design-Builder shall salvage the cabinet, controller, and any type of detector other than a loop detector, for all temporary signal system installations and deliver the salvaged items to a location determined by the Department. The salvaged items will become the property of the Department.

18.4.9 Temporary Lighting

18.4.9.1 General

The Design-Builder shall:

- Design temporary lighting plans.
- Maintain current levels of roadway illumination for all roadway segments and interchanges that are currently lit.

- Provide all materials and equipment for temporary lighting installations, using either screw-in bases and poles or wooden poles.
- In the clear zone, provide only lighting units that are breakaway or protected from crash potential.
- Provide maintenance for the temporary lighting system.

18.4.9.2 Screw-in Bases, Wooden Poles

If screw-in bases and poles are used for temporary lighting, the bases, poles, and accessories shall be salvaged after the Project construction and delivered to the Department. These salvaged items will become the property of the Department. If wooden poles are used, the Design-Builder shall remove the poles before Final Acceptance. The wooden poles shall remain the property of the Design-Builder.

18.4.9.3 Power Service Costs

The Department or others will pay all monthly electrical bills for lighting after Final Acceptance of the Project.

The Design-Builder shall coordinate with the local power supplier to provide the power service connection. The Design-Builder shall pay all costs charged by the electric power companies for providing power connections. The Design-Builder shall pay the monthly electric bills for temporary lighting installed under the Contract until Final Acceptance of the Project.

18.4.10 MOT Traffic Control Supervisor

The Design-Builder shall provide a MOT Traffic Control Supervisor (TCS) to manage and monitor all MOT operations for the duration of the construction. The TCS will be considered a critical component of the Design-Builder's management team and must have prior experience managing MOT operations on similarly complex projects. The TCS does not need to be a licensed professional engineer; however, the Design-Builder may elect to use his Traffic Engineering Manager in this position.

The TCS or his designate shall be available on a 24-hour per day basis throughout the duration of the Project, must participate in all changes in the MOT setup, and perform daily Project reviews to verify that MOT devices are correctly placed and traffic is safely and efficiently moving through the Project. The TCS or his designate shall be available on the Site within 45 minutes of notification of an emergency situation and be prepared to positively respond to the need to repair the work zone traffic control or to provide alternate traffic arrangements. The TCS shall have enough authority and resources to immediately correct any deficiencies discovered or to demobilize any construction operation that is resulting in excessive delays to traffic or creating an unsafe condition.

18.4.11 Access

At a minimum, the Design-Builder shall provide the following:

- Access for emergency vehicles and buses to all residences and businesses at all times
- Access to properties of existing property owners during construction by the end of each day
- Temporary access where needed to maintain access to properties

18.5 Deliverables

18.5.1 Traffic Management Plan (TMP)

The Traffic Management Plan must be approved prior to issuance of NTP2. The TMP shall be signed and sealed by the Traffic Engineering Manager. The Department will respond to the submittal within 5 Working Days.

18.5.2 Released For Construction Documents (RFC)

The Design-Builder shall produce plans and specifications in a format that facilitates design review by the Department. Refer to the Caltrans CADD User Manual, Plans Preparation Manual, and the Design Quality Management Plan, for required information on Released for Construction documents. The RFC documents shall include the following items:

- Stage Construction Plans
- Traffic Handling Plans
- Detour Plans
- Specifications and Special Provisions

These RFC documents, and any subsequent revisions, shall be signed and sealed by a California licensed Professional Engineer and submitted to the Department for approval. The Department will respond to the submittals within 5 working days. The approved RFC documents must be distributed to all stakeholders at least 2 working days prior any construction activities relating to these documents.

18.5.3 Reports/Project Documentation

The Design-Builder shall provide the Department with all correspondences and meeting minutes regarding MOT issues.

The Design-Builder shall prepare bound reports and Project documentation in hardcopy and electronic format, organized by design topic, and delivered to the Department prior to Final Acceptance.

18.5.4 As-Built Plans

Upon completion of the Project, the Design-Builder shall deliver to the Department a complete set of As-Built Documents and design files that incorporate all design changes and details of Accepted Work that occurred throughout the Project. The As-Built shall be signed by a licensed California Professional Engineer and be provided in both electronic and hardcopy formats.

EXHIBIT 18-A

Lane Requirement Chart Guidelines

This exhibit is provided as an electronic file.

19 MAINTENANCE DURING CONSTRUCTION

19.1 General

The Design Builder shall conduct all Work necessary to meet the requirements associated with maintenance during construction.

Design, construct and maintain the roadways in accordance with requirements of this specification, including performance requirements, standards, warranties, design and construction criteria, maintenance during construction, and required submittals.

Design Builder shall be responsible for the maintenance and upkeep of the entire area within the planned right of way limits, including freeway, local roads, bridges, landscaping and appurtenant facilities, and shall also be responsible for maintenance and upkeep of facilities within those portions of the Planned Right of Way limits outside of the planned right of way limits while construction Work is ongoing in the area or while such facilities are being used for maintenance of traffic related to the Project. The goal shall be to maintain the facilities in the condition in which they have been constructed, or as close to such condition as is reasonably possible. Maintenance responsibilities shall include the operation of freeway and local road facilities and services to provide satisfactory and safe conditions for highway and local road traffic and emergency responses as necessary to ensure public safety in all areas open to public traffic.

19.2 Administrative Requirements

19.2.1 Standards

The Design Builder shall maintain the project during construction in accordance with the requirements of the standards listed by priority below.

If there is any conflict in standards, adhere to the standard with the highest priority. However, if the Submittal has a higher standard than any of the listed standards, adhere to the submittal standard.

If there is any unresolved ambiguity in standards, obtain clarification before proceeding with design or construction.

Use the most current version of each listed standard as of the IFP issue date unless modified by Addendum or Change Order.

Maintenance During Construction Standards and Requirements

Priority	Author	Agency Title
1	Department	Maintenance Manual Volumes I and II
2	Department	Construction Manual
3	Department	Standard Special Provisions
4	Department	2006 Revised and New Standard Plans
5	Department	Standard Plans May 2006
6	Department	Design-Build Modifications to the Standard Specifications
7	Department	Standard Specifications
8	Department	Highway Design Manual (HDM)
9	AASHTO	Roadside Design Guide, 3 rd Edition

10	AASHTO	Policy on Geometric Design of Highway and Streets
11	Department	Project Development Procedure Manual
12	Department	Technical Memoranda
13	Department	Environmental Document

19.2.2 Maintenance Management Plan

The Design-Builder shall prepare a Maintenance Management Plan that includes the following:

- A list of all proposed routine maintenance activities
- Schedule of proposed routine maintenance activities
- Name of the Design-Builder's supervisor who will be in charge of maintenance efforts

19.2.3 Meetings

The Design-Builder's supervisor responsible for maintenance during construction shall attend weekly field meetings.

19.3 [NOT USED]

19.4 Construction Requirements

19.4.1 Design-Builder's Responsibilities

The Design-Builder shall assume maintenance of the entire Project, except for those activities that will be performed by the Department, counties, and cities as specified in Section 19.4.2, commencing at 12:01 a.m. on the first Day after Contract execution. This maintenance responsibility shall continue until 11:59 p.m. on the date of Final Acceptance by the Department. In general, this maintenance will include all routine maintenance normally performed by the Department, counties, and cities on time cycles equal to, or less than, the Contract duration. Also included shall be the required maintenance and repair of all Project facilities damaged by normal wear, forces of nature, or acts of third parties. The Design-Builder shall be responsible for maintenance of the following:

1. Temporary facilities
2. Existing facilities that are to be later replaced or reconstructed as part of the Contract Work
3. Existing facilities that are to remain
4. Haul routes for Project materials
5. Project detours initiated by the Design-Builder

Maintenance on temporary or existing facilities to be replaced shall be performed to provide a safe, effective, and aesthetically pleasing transportation corridor. Effort required on existing facilities to remain shall be for the added criterion of maintaining the service life of that facility.

Responsibilities of the Design-Builder include the following:

- Repair of shoulder drop-offs
- Replacement/repair of existing asphalt shoulders if used for temporary traffic control or hauling
- Replacement/Repair of temporary roadways and crossovers
- Replacement/repair of traffic attenuators
- Maintenance of temporary delineators, temporary signing, and temporary pavement marking

-
- Drainage/erosion control maintenance related to construction activities
 - Repair of approach slabs damaged by construction operations
 - Maintenance of haul routes
 - Temporary lighting and signal system maintenance
 - Fence maintenance including Right of Way fencing and temporary fencing
 - Noxious weed control
 - Litter control
 - Graffiti removal on new construction items
 - Maintenance of storm sewer system related to construction activities
 - Replacement/repair of temporary and permanent barrier wall
 - Maintenance of traffic control devices displaced by the Department's snow removal efforts, if supplied by the Design-Builder

19.4.2 Department Responsibilities

The Department will be responsible for the following:

- Inspections of existing structures
- Repairs to existing major structures to remain (bridges and overhead sign structures)

19.5 Deliverables

The Design-Builder shall submit the Maintenance Management Plan to the Department for their Acceptance within 60 Days after issuance of NTP1.

The Design-Builder shall prepare and submit to the Department a monthly Maintenance Report detailing all maintenance activities performed. The report shall subdivide the reported activities as detailed in Section 19.4.1 above.

20 [NOT USED]

21 PAVEMENTS

21.1 General

The Design Builder shall perform all Work necessary to meet the requirements to design and construct pavement for all roadways in accordance with the requirements of this provision; design and construct the project in accordance with requirements of this specification, including performance requirements, standards, warranties, design and construction criteria, maintenance during construction, and required submittals. The Design-Builder shall coordinate with the Department to ensure that the appropriate design methods, procedures, submittals, plan preparation, analysis methodology, review/comment processes, approval procedures, specifications and construction requirements are met.

21.2 Administrative Requirements and Guidelines

21.2.1 Standards and Requirements

Perform the pavement analysis and design in accordance with the requirements of the standards listed below by priority. If there is any conflict in standards, adhere to the standard with the highest priority. However, if the Design-Builder's Submittal has a higher standard than any of the listed standards, adhere to the Submittal standard. If there is any unresolved ambiguity in standards, it is the Design-Builder's responsibility to obtain clarification before proceeding with design and/or construction. Use the most current version of each listed standard as of the [Instruction to Proposers (ITP) or Invitation for Bid (IFB)] issue date unless modified by addendum or change order.

Roadway Pavement Standards and Requirements

Priority	Agency	Title
1	Department	Pavement Policy Bulletins
2	Department	Design Information Bulletins
3	Department	Highway Design Manual
4	Department	Life Cycle Cost Analysis Procedures Manual
5	Department	District Pavement Policies and Standards
6	Department	Standard Special Provisions
7	Department	2006 Revised and New Standard Plans
8	Department	Standard Plans May 2006
9	Department	Design-Build Modifications to the Standard Specifications for Construction
10	Department	Standard Specifications
11	Department	California Test Method and Lab Procedures
12	Department	Plans Preparation Manual
13	Department	Pavement Tech Note
14	Department	Revised and Updated Standard Specification
15	Department	Revised and Updated Standard Special Provision

21.2.2 References

Use the references listed below as supplementary guidelines for the roadway pavement analysis and design. These references are not mandatory on the Design Builder.

Roadway Pavement References

Agency	Title
Department	Pavement Technical Guidance
Department	California Department of Transportation Pavement Website
AASHTO	Guide for Design of Pavement Structures and 1998 Supplement
Department	Ready to List and Construction Contract Award Guide (RTL Guide)
Department	Maintenance Technical Advisory Guide

21.2.3 Engineering Documents

Exhibit 21-A shows the proposed pavement design for the Project. Verify all information prior to use. Any information, such as traffic projections, equivalent single axle load projections, or changes to pavement standards and policies that would require modifying the proposed pavement design shall be brought to the attention of the Department for resolution prior to initiating work.

The Design-Builder shall not make Project changes that alter the essential functions and characteristics of the Project, such as safety, pavement design life, traffic operations, durability, desired appearance, maintainability, environmental protection, drainage, and other permitted constraints; without obtaining the prior approval of the Department including any necessary design exception or exemptions. Design-Builder shall perform the Work in accordance with the Standards and Requirements set forth in these Technical Provisions unless the Design-Builder obtains a deviation or Exception to those Standards or Requirements in accordance with the design review process set forth in the Design-Build Contract.

21.2.4 Software Requirements

The Design-Builder shall utilize statewide approved roadway pavement software for analyzing and developing details for the pavement structure recommendations in Exhibit 21-A listed in the following Department website:

www.dot.ca.gov/hq/esc/Translab/OPD/DivisionofDesign-software.htm The Design Builder may at its own discretion use any software when submitting plans for approval but shall prepare the final drawings using MicroStation SE and CAiCE Version 10SP6 as the drafting and design software, respectively.

21.2.5 Equipment Requirements

The Design-Builder shall use profilograph and falling weight deflectometers for field measurements of pavement. The equipment shall meet the requirements of California Test Method CT 526 and 356 respectively and shall be calibrated in relation to Caltrans equipment.

21.2.6 Personnel Requirements

The Design Builder shall provide a Pavement Engineer who performs pavement calculations, develops pavement structure recommendations, details, or plans. The Pavement Engineer shall be

licensed in the State of California and shall have a minimum of five (5) years experience in structural pavement design.

21.2.7 Certification Requirements

The Design-Builder shall perform all laboratory testing at a Department certified and approved lab and an AMRL-accredited facility for material tests required by this section. All material testers shall be certified for the materials they are testing.

21.2.8 Meetings

The Department and the Design-Builder shall meet at the request of one of the parties, as necessary, to discuss and resolve matters relating to the roadway pavement work during the design and construction stages. The requesting entity shall provide the other entity with not less than five (5) days prior notice of such meetings. The Design-Builder shall prepare and distribute a record of the minutes to the meeting within five (5) days.

21.2.9 Coordination with Other Agencies and Disciplines

The Department will assist in the coordination and resolution of all roadway pavement issues with affected interests and regulatory agencies. The Design-Builder shall document the resolutions of issues for the correspondence file, including meeting minutes and memoranda for the record. The Design-Builder shall document the permit requirements and contacts with the permitting agencies.

21.3 Design Requirements

21.3.1 Roadway Pavement Concept Meeting

The Design-Builder shall schedule and participate in a roadway pavement concept meeting to present the strategy for the proposed pavement structural section recommendations on the Project to the Department. The Design-Builder shall use the outcome of the meeting to finalize the pavement needs of the Project.

21.3.2 Roadway Pavement Analysis and Design

The Design-Builder shall design, construct, and where applicable, maintain pavements. The Design-Builder shall follow all standards and guidance listed in this provision and as described in *Caltrans Highway Design Manual* (particularly Chapters 600 to 670) in preparing pavement plans, specifications, and estimates. The Design-Builder shall provide a pavement design based on the designs in Exhibit 21-A and that meets the following performance requirements:

- Provide a pavement Design-Life per Chapter 610 of the *Highway Design Manual*
- Provide a durable maintainable pavement system that meets or exceeds pavement design life criteria with the specified structural capacity; skid resistance, and superior ride quality
- Include pavement-to-structure transition areas as a part of ride quality
- Minimize pavement-to-structure transition deviations
- Minimize pavement type-to- pavement type transition deviation
- Minimize rutting, and maximize maintainability at intersections
- Provide bridge pavement approach slabs per Chapter 670 of the *Highway Design Manual* and associated publications.

- Provide free-draining pavement sections both above and beneath the pavement surface for pavement constructed on this Project. Do not exacerbate sub-grade moisture below existing pavement that is left in place, and
- Finished pavement shall conform to Caltrans Standard Specifications

The Design-Builder shall analyze and prepare separate pavements designs, as applicable, for locations not covered in Exhibit 21-A such as temporary construction areas.

The Design-Builder shall use a minimum concrete pavement width of six (6) feet to prevent volunteer transverse cracking when using rigid pavement on pavement widening and gore areas.

21.3.3 Pavement Types

The Design-Builder shall consider rigid, flexible or composite pavements as a pavement type for the design. In selecting a pavement type, the Design-Builder shall consider, at a minimum, the following factors. Refer to Chapter 600 of the *Highway Design Manual* for a complete list:

- Pavement Design Life – The Design-Builder shall provide a pavement design life in accordance to Topic 612 of the *Highway Design Manual*.
 - In selecting a pavement design life, if the Design-Builder determines that a Life-Cycle Cost Analysis (LCCA) is necessary, the Design-Builder shall prepare such Analysis in conformance to the procedures and data in the *Life-Cycle Cost Analysis Procedures Manual*.
- Traffic Considerations
 - The Design-Builder shall use traffic projections provided in the Project Report or the Final Environmental Document to determine expected traffic loads, which in turn are used to develop 18-kip Equivalent Single Axle Load (ESAL) constants. The Design-Builder shall determine the Traffic Index (TI) using these ESAL constants in accordance to Chapter 600 of the Department *Highway Design Manual*.
 - • Soils Characteristics - 600 The Design-Builder shall provide a subgrade soil that is adequate to carry projected traffic loads during the life of the pavement.
- • Climate regions
 - The Design-Builder shall consider providing continuity of existing pavement type and shall consider all factors stated in Chapter 600 of the Department *Highway Design Manual*.
- • Materials
 - Availability of materials, recycling and maintainability of materials

The Design-Builder shall provide pavement structures that shall consist of a combination of roadbed materials placed in layers above the subgrade and materials placed shall conform to the Department *Standard Specifications*. The Design-Builder shall submit complete roadway pavement structural section recommendations to the Department for approval. Construction of submitted pavement structural sections shall not commence until the Design-Builder receives notice of Release for Construction. The Design-Builder will receive a response within 15 days of receipt of such submittal. Any subsequent changes in structural sections shall be documented and processed in accordance to the Standards set forth in this provision.

21.3.4 [NOT USED]

21.3.5 Special Pavement Designs

Special roadway pavement designs shall be fully justified and submitted for approval. Special roadway pavement designs are defined as those that meet either or both all of the following criteria:

- Involve products, methods, or strategies that either reduces the structural thickness to less than what is determined by the standards set forth in this provision.
- Utilize experimental products or procedures not covered in the engineering tables or methods found in the standards set forth in this provision.

The Design-Builder shall submit to the Department special designs for approval in accordance to the process described in Topics 82 and 606 of *Caltrans Highway Design Manual*. Expected timelines for approval of special designs are:

- 30 days for exceptions to mandatory pavement design standards and for nonstandard modifications to existing standard special provisions.
- 90 days for application of new products or strategies not covered in the *Caltrans Standard Special Provisions* and *Standard Specifications* and for new nonstandard special provisions.
- 120 days for use of experimental or nonstandard design procedures.

21.3.6 Materials Report

For any modifications to the design for locations not covered in the designs in Exhibit 21-A, the Design-Builder shall prepare a Materials Report and submit to Department for approval. The Design-Builder shall prepare the Materials Report in accordance to Topic 114 of the *Caltrans Highway Design Manual*.

21.3.7 Temporary Pavements and Detours

The Design-Builder shall design temporary pavements and detours to accommodate the traffic loading the pavement will experience during the construction period using the standards and procedures for new construction except where noted otherwise.

21.3.8 Supplemental Pavement Requirements

21.3.8.1 Pavement Compaction

Pavement Compaction shall be in accordance to the *Caltrans Standard Special Provisions* and *Standard Specifications*.

21.3.8.2 Profile Index

The pavement surface shall be profiled, in accordance to the *Caltrans Standard Special Provisions* and *Standard Specifications*.

21.3.8.3 Quieter Pavement

The Design-Builder shall utilize approved quieter pavement surface treatments where required as stipulated in Pavement Policy Bulletin 9-02 *Quieter Pavement Strategies for Noise Sensitive Areas*.

21.3.8.4 Tapers and Transitions

The Design-Builder shall design and construct tapers and transitions in accordance with the *Pavement Tapers and Transition Guide*.

(<http://www.dot.ca.gov/hq/esc/Translab/ope/Pavement-Tapers-&-Transitions-Guide.pdf>).

Where project abuts a previously overlaid segment of roadway, the taper of the Project shall overlay the taper placed on the previous overlay to provide a smooth transition.

21.3.8.5 Pavement Widening

In addition to the Standards and Requirements in 21.2.1, pavement widening design shall be in accordance with Pavement Policy Bulletin 10-1 *Pavement Design for Widening Projects*. In addition, the adjacent lane to the widening shall be repaired and rehabilitated as needed to match the pavement design life of the widening in order to provide a smooth transition between existing and new pavement. For concrete pavements, if more than 5% of the slabs in the lane adjacent to the widening require replacement in accordance with the *Slab Replacement Guidelines*, then a life cycle cost analysis shall be in done in accordance with Design Information Bulletin 81 *CAPM Guidelines* and the *Life Cycle Cost Analysis Procedures Manual*. If the life cycle cost analysis indicates that lane replacement is more cost effective, the adjacent lane shall be replaced in accordance with the *Jointed Plain Concrete Pavement Rehabilitation and Preservation Guide*.

21.4 Construction Requirements

Construction shall be in accordance with the requirements of the *Standard Specifications* and the Special Provisions.

21.4.1 Pavement Evaluation on Ride Quality and Skid Resistance

The Design-Builder shall evaluate ride quality in all lanes and shoulders using a profilograph as indicated in the *Caltrans Standard Special Provisions*. The Design-Builder shall supply the profilograph and the Certified Qualified Operator (CQO) certified results. The Department shall use the CQO certified results to determine Substantial Completion of pavement work. A verification of the ride quality may be conducted. The Department will evaluate skid resistance. Existing skid resistance on pavement that remains in place shall not be reduced. Pavements placed by the Design-Builder shall provide a skid resistance value greater than 50.

21.4.2 Removal of Pavement

Existing PCC and AC pavement of the traveled way and shoulders, to be removed, shall be removed without affecting the adjacent pavement to remain. In the event material underlying removed pavement is disturbed, it shall be recompacted to a relative compaction of not less than 95 percent.

21.5 Deliverables

The Design-Builder shall develop Released for Construction (RFC), As-Built Plans and Documents in accordance with the requirements of this section.

21.5.1 Materials Design Recommendation

The Design-Builder shall submit one hardcopy of the documentation for the Materials Design Recommendation accepted by the Department as well as subsequent updates of construction changes to the pavement structure. The documentation shall, at a minimum, contain:

- Pavement design life (including both the construction year and design year),
- The California R-values and unified soil classification of the sub grade soil
- The California R-value(s) or strength properties for the materials selected for the sub base and/or base layers
- The Traffic Index (TI) for each pavement structure

- Depth and type of pavement
- Depth and type of sub base and/or base layers
- The Design-Builder shall include on the first sheet of the project typical section plan sheets, the project design designation information in accordance with Topic 103 of the *Caltrans Highway Design Manual*.

21.5.2 Materials Report

The Design-Builder shall submit one hardcopy of the Materials Report. The Materials Report shall be prepared in reference to Topic 114 of the *Caltrans Highway Design Manual*.

21.5.3 Over-the-Shoulder Design Documents

During the design process, any submittals required in the Design Standards or other Contract Documents shall be prepared by the Design-Builder. Submittals shall be in an acceptance format and organized to facilitate their review.

21.5.4 Released for Construction (RFC) Documents

The Design-Builder shall produce plans and specifications in a format that aids and facilitates design review, and provide adequate information for safe, efficient, and high-quality construction. Plan sets and sheet types shall be developed in accordance with the *Caltrans CADD Standards*, *Caltrans Plans Preparation Manual*, and the Design Quality Management Plan before construction may begin. Approval for all RFC documents is required.

21.5.5 Final Design Documents

The Design-Builder shall submit final design documents when the design is complete, including office and field generated design changes. Final design documents include:

- Plans
- Design calculations
- Reports/Project documentation
- Specifications and Special Provisions

21.5.5.1 Design Justification Reports and Project Documentation

Upon request, the Design-Builder shall submit design justifications when the Design-Builder shall consider various factors or alternatives. Documentation may be computer generated or hand written and shall clearly identify the following:

- Design issue
- Items requiring consideration
 - Basis for evaluation
 - Final decision and justification

For justifications that require exceptions to pavement mandatory standards as found in the *Caltrans Highway Design Manual* and *Pavement Policy Bulletins*, an *Exception to Mandatory Pavement Design Standard* shall be prepared and submitted for approval. Other justifications that qualify as special designs per Topic 606 of the *Caltrans Highway Design Manual* shall be submitted in accordance with the submittal requirements in Topic 606.

The Design-Builder shall prepare and submit bound design calculations and Project documentation. These submittals shall be in indexed paper or electronic format, organized by design topic, and delivered to the Department.

21.5.5.2 Non- Standard Specifications and Non-Standard Special Provisions

If the Design-Builder requests Approval to Specifications and Provisions that are not the Department standards, such request shall include comprehensive specifications and provisions associated with the proposed non-standard methods or materials. The Department will review the submittals within ten (10) working days. No additional time will be added to this contract due to the Department review time. The Department's review does not guarantee approval.

21.5.6 As-Built Documents

Upon completion of the Project and prior to Final Acceptance, the Design-Builder shall deliver a complete set of as-built documents and design files that incorporate all design changes and details of Accepted Work that occurred throughout the Project. As-Built Documents must be submitted in both hardcopy and electronic form. The As-Built Documents shall meet the format and content requirements of Final Design Documents.

21.5.7 Profilograph and Data Core Data

The Design-Builder shall submit profilograph data and data cores as completed in accordance with Sections 39 and 40 of the *Caltrans Standard Specifications* and associated standard special provisions.

21.5.8 Quality Control Documents

The Design-Builder shall submit quality control reports and test results as completed in accordance with Sections 39 and 40 of the *Caltrans Standard Specifications* and associated standard special provisions.

EXHIBIT 21-A

Proposed Pavement Design

This exhibit is provided as an electronic file.

22 STORMWATER

22.1 General

The Design-Builder shall conduct all Work necessary to meet the requirements associated with stormwater, including permanent and temporary best management practices, structural pollution control devices, retention/detention facilities (ponds), conveyances, erosion control, protection of downstream water bodies, sampling, erosion control, permit compliance, and overall water quality protection in accordance with all applicable state and federal regulations.

22.2 Administrative Requirements

22.2.1 Standards

Design and construct the stormwater systems in accordance with the relevant requirements of the standards listed by priority below.

If there is any conflict in standards, adhere to the standard with the highest priority. However, if the Design-Builder's Submittal has a higher standard than any of the listed standards, adhere to the Submittal Proposal standard.

If there is any unresolved ambiguity in standards, it is the Design-Builder's responsibility to obtain clarification from the Department before proceeding with design and/or construction. Use the most current version of each listed standard as of the Invitation to Bid (ITB) issue date unless modified by Addendum or Change Order.

Stormwater Standards

Priority	Agency	Title
1.	Department	Standard Special Provisions
2.	Department	Standard Specifications
3.	Department	Standard Plans
4.	Department	Highway Design Manual
5.	Department	Project Planning and Design Guide (PPDG)
6.	Department	Department Treatment BMP Design Guidance Documents
7.	Department	Stormwater Pollution Prevention Plan (SWPPP) and Water Pollution Control Program (WPCP) Preparation Manual
8.	Department	Construction Site Best Management Practices (BMPs) Manual
9.	Department	Construction Site Stormwater Quality Sampling Manual
10.	USDA	Revised Universal Soil Loss Equation, Version 2 (RUSLE II)
11.	Department	Construction Manual

22.2.1.1 Permits

1. Department NPDES Permit 99-06-DWQ
2. Department Stormwater Management Plan
3. NPDES General Permit For Storm Water Discharges Associated with Construction 2009-0009-DWQ (CGP 2009-0009-DWQ effective July 1, 2010)
4. Project Specific 404 Permit related to stormwater (if applicable)

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5. Project Specific 401 Certification requirements related to stormwater (if applicable)
 7. Project Specific Fish and Game 1601 requirements related to stormwater (if applicable)

22.2.2 References

Use the references listed below as supplementary guidelines for the drainage systems analysis and design. These publications have no established order of precedence.

Stormwater Publications References

Agency	Title
AASHTO	Roadside Design Guide
AASHTO	Model Drainage Manual
Department	Ready-To-List and Construction Contract Award Guide (RTL Guide)
Department	Fish Passage Design for Road Crossings
FHWA	Hydraulic Engineering Circulars (as listed in the Department Highway Design Manual)
FHWA	Hydraulic Design Series (as listed in the Department Highway Design Manual)
CASQA	California Stormwater Quality Association (CASQA) Construction BMP Handbook

22.2.3 Preliminary Engineering Plans

The Preliminary Engineering Documents show only a preliminary design for the Project. These drawings and the supporting electronic files are included to illustrate the general scope of improvements. Verify all information prior to use.

The Design-Builder shall have the flexibility to make Project changes without impairing the essential functions and characteristics of the Project, such as safety, traffic operations, durability, desired appearance, maintainability, environmental protection, drainage, and other permitted constraints.

Best Management Practice design shall follow the *Department Project Planning and Design Guide* and design guidance documents. The Design-Builder may use the plans and specifications developed by the Department or they may choose to develop a special design to fit the project needs with coordination and approval of the Department's Headquarters Office of Storm Water Management - Design. The intent is to provide some flexibility in the size or shape of the existing approved BMPs, but not to use proprietary devices that have not been tested for effectiveness by the Department. Proprietary devices may only be used with prior approval of Headquarters Office of Storm Water Management – Design and with appropriate testing information to assure that they are feasible long-term for a Department facility. The stormwater design shall include a feasibility analysis of BMPs to document that the NPDES permit threshold for compliance of Maximum Extent Practicable (MEP) has been met.

All approved treatment BMPs have guidance, plans sheets, and specifications developed by the Department. This information is available on the Department's Storm Water webpage (<http://www.dot.ca.gov/hq/oppd/stormwtr/index.htm>).

22.2.4 Software

The Design-Builder shall prepare drawings in MicroStation and provide a copy in adobe acrobat to share with other agencies that do not have Microstation. The Storm Water Data Report (SWDR) shall be submitted in Microsoft Word, Microsoft Excel, and Adobe Acrobat formats.

22.2.5 Stormwater Data Collection

The Design-Builder shall follow the PPDG in the preparation of the SWDR. The PID and PA/ED level SWDR information (see Exhibit 22-A) shall be used by Design-Builder to develop the PS&E level equivalent SWDR. The SWDR will utilize information from the environmental document, drainage report, geotechnical report or other project information pertinent to the overall stormwater design and as described in the PPDG, and described in Section 12 to determine the stormwater design. The calculations for drainage design and stormwater should be consistent in methodologies for hydrology and hydraulics, though there may be some additional storm frequencies and durations needed for design of BMPs. If alternative methods are used to determine flows due to permit requirements, then the assumptions shall be clearly noted. To establish a stormwater drainage system that complies with the requirements and accommodates the historical hydrologic flows, the Design-Builder must calculate the pre and post hydrology for all sub watersheds within the project site.

22.2.6 Coordination with Other Agencies and Disciplines

The Design-Builder shall coordinate all water resource issues with local agencies, affected interests, and regulatory agencies. The Design-Builder shall document the resolutions of issues for the correspondence file, including meeting minutes and memoranda for the record. The Department will assist in the coordination and resolution of all stormwater issues with affected interests and regulatory agencies.

The Design-Builder shall comply with and document the permit requirements, modifications, and contacts with the permitting agencies. The stormwater design should be based on the Department standards, plans, specifications, guidance, and permits. Local standards for stormwater design do not always meet the Department's threshold for feasibility or may not be appropriate for the highway environment due to many competing standards the Department must meet including, but not limited to safety, aesthetics, and maintenance.

22.2.7 Training Qualifications and Certification

The Design-Builder shall provide staff with qualifications and certifications related to development of plans, specifications, reports, and construction related stormwater requirements in local, state, federal, and the Department provisions. Those qualifications include but are not limited to the following:

- California Registered Civil Engineer in accordance with the California Engineering Act for all engineering calculations.
- Registered Civil Engineer Stamp on final SWDR
- A qualified SWPPP Developer in accordance with Section VII of the CGP 2009-0009-DWQ.
- A qualified SWPPP Practitioner in accordance with Section VII of the CGP 2009-0009-DWQ.

22.3 Design Requirements

The Design-Builder shall develop a SWDR using the existing drainage information and previous Storm Water Data Reports provided. The design should follow the requirements contained in the PPDG, Environmental Document, Permits, and design guidance to develop a final SWDR report,

plans and specifications. A draft PS&E SWDR will be submitted to the Department for review at least 8 weeks prior to the commencement of any soil disturbing activities.

22.3.1 Surface Hydrology

22.3.1.1 Design Frequencies

The design frequencies for the drainage shall meet the requirements of Section 12. Stormwater treatment BMP design should use the frequencies recommended in the Department's BMP design guidance. Design Pollution Prevention BMPs should use appropriate frequencies for the function of the BMP and in accordance with methodologies in the *Department Highway Design Manual* or other appropriate civil engineering methodologies.

22.3.1.2 Hydrologic Methods

The Design-Builder shall perform hydrologic analyses and follow design methodology as prescribed by the *Department Highway Design Manual*.

The methods used for sizing BMPs should utilize the calculated drainage data wherever possible, but the hydrology calculations for drainage are not always the same frequency or duration as stormwater design, so additional analysis for BMP design is commonly required.

The drainage information shall include analysis of pre-project and post-project hydrology, so the Design-Builder can analyze the down stream effects of the project hydrology and document them in the SWDR. The post project hydrology should include the post construction BMPs as they will help reduce the water quality impacts of changes in flows, volume, and chemistry.

22.3.2 Permanent Stormwater Treatment System

The Design-Builder shall design stormwater treatment systems to meet requirements for water quality, water quantity, and rate control, as determined by local, State and federal requirements and the Department NPDES regulations.

22.3.3 BMP Structures

For all treatment BMP Structures that the Design-Builder chooses to modify, they shall provide a special design and structural analysis for the approval of the Headquarters Office of Storm Water Management - Design and HQ Office of Structure Design. This shall be submitted with a letter requesting the modification and stating the need for change. Additionally, all hydraulic calculations shall be provided for the modified BMP and shall be designed to meet the requirements in the *Department Highway Design Manual* for bypass of flows above the water quality volume or flow or local regulations when applicable.

22.3.3.1 Conveyances

Many stormwater conveyances also function as design pollution prevention BMPs and shall be designed to standards of the *Department Highway Design Manual* and *Project Planning Design Guide*. They should also be documented in the SWDR as they protect water quality, prevent erosion, and provide a water quality benefit. Appendix A of the PPDG describes many of the design pollution prevention BMPs that may be utilized in the project design.

22.3.3.2 Stormwater Mapping

The Design-Builder shall map the drainage area in accordance with Section 12 of Book 2. In addition the Design-Builder shall incorporate this information into the SWDR including sub water shed areas, flows, and volumes used to design and size BMPs, which may not always be in the drainage report.

21.3.3.3 Bio-Swales and Roadside Open Channels

The Design-Builder may use Bio-Swales, which are an open channel, if they meet the design criteria for shear stress provided in Section 12 of Book 2, *the Department Highway Design Manual*, and HEC 15. Bio-swales are an approved treatment BMP, but care must be taken in the design to provide a stable facility beyond the life of temporary BMPs so that a long term erosion problem does not occur.

22.3.4 Project Specific requirements

- The Project is to replace the existing concrete panels with hot mix asphalt. The locations of the panel replacement are from post mile 9.5 to Post-Mile 10.0 and from Post Mile 11.7 to Post Mile 13.1. A typical panel dimension is 12ft x 15ft. The quantities and location are shown in reference drawing Quantity sheet Q-1
- From post mile 10.0 to 11.6, Remove the existing Portland cement concrete (PCC) pavement and a 0.35' asphalt concrete overlay on top in lane No. 2. Construct a 14' wide continuous re-enforced concrete pavement. Removed the 10' existing outside shoulder and replace with 8' wide hot mix asphalt concrete shoulder
- From post mile 10.0 to post mile 11.6. Rebuild the median with a 12' Joint Plain Concrete Pavement (JPCP) from edge of travel way with 2% slope towards the concrete barrier. Replace lane no.1 with Joint Plain Concrete Pavement (JPCP). All concrete lanes shall be design supported.
- *See General Description Section 1.3.3*

22.4 Construction Requirements

The stormwater requirements shall be in accordance with the Department NPDES permit 99-06-DWQ, the Construction General Permit 2009-0009-DWQ, the *Department Construction Site BMP Manual*, the *Department Construction Site Storm Water Quality Sampling Manual*, Plans, Specifications, and the *Department Construction Manual*. There may be project specific permits with provisions related to the construction of the project that must be met.

The construction site water pollution control plan shall include BMPs in the plans, specifications, SWDR, and SWPPP/WPCP as instructed in the Department guidance.

Drainage shall be designed and constructed to accommodate construction staging and shall be provided during all stages of construction. The Design-Builder shall provide drainage design details for each stage of construction. The design shall include temporary erosion control and other Best Management Practices needed to satisfy the NPDES and other regulatory requirements. The water resources notes in the plans shall include a description of the drainage design for each stage of construction.

22.5 Deliverables

22.5.1 Project Drainage Overview Map

The Design-Builder shall submit a Project Drainage Overview Map to the Department for acceptance prior to initiating detailed design, and shall submit a copy of the Project Drainage Overview Map in MicroStation format.

22.5.2 Released for Construction Documents (RFC)

The Design-Builder shall produce plans and specifications in a format that facilitates design review by the Department. The Released for Construction Documents shall include the following items:

- Storm Water Data Report [follow the Department PPDG for equivalent of PS&E level SWDR and must be stamped].
- Electronic Excel SWDR and TMT submittal for tracking BMPs for design compliance monitoring (2 spread sheets)
- SWPPP/WPCP in accordance with CGP
- Risk Assessment in accordance with CGP
- Temporary and permanent erosion control plans
- Specifications, Special Provisions, and Non-Standard Special Provisions

22.5.3 Construction General Permit

As part of compliance with the CGP, the Design-Builder shall:

- File all permit registration documents (PRD's) with State Resources Control Board at least 30 days prior to any disturbing activities.
 - a) Notice of Intent (NOI)
 - b) Risk Assessment (CGP Section VIII)
 - c) Storm Water Pollution Prevention Plan (CGP Section XIV)
 - d) Annual Fee
 - e) Signed Certificate Statement
- Prepare and complete Rain Event Action Plans (as required)
- Submit and file the Notice of Termination at the Completion of the project

They shall also complete and submit the annual report (CGP Section XVI). Copies of the documents shall be provided to the Department

22.5.2.1 Drainage Plans

As part of the drainage plans show the locations of all structural stormwater treatment BMPs, including bio-filtration strips and swales.

22.5.2.2 Temporary and Permanent Erosion Control Plans

Temporary BMPs shall be included in the plans and included in the SWPPP, using the Department Standard Plans and construction site BMP manual. If there are non-standard BMPs or non-standard application of temporary BMPs, they shall be identified in the specifications or in the construction details.

All Permanent BMPs shall be shown on the plans. The Design-Builder shall label alignments, stationing, walls, bridges, paths/walks, lakes, rivers, environmentally sensitive areas, R/W and easements, existing drainage structures and pipes, proposed drainage structures and pipes, surface flow arrows, riprap locations, check dams, silt fences, rolled erosion control products, seeding, mulch areas, and other erosion control items. Plans shall also include high and low point station and elevation, ponds, normal water line, high water line, coordinate grid ticks and labels (minimum of three per sheet), land feature changes, erosion control features, and notes.

22.5.2.3 Specifications and Special Provisions

If the Design-Builder requests the Department's (Caltrans) approval to use methods or materials that are not the Department standards, such request should include comprehensive specifications and provisions associated with the proposed non-standard methods or materials. A minimum 5 Days review period applies.

The HQ Office of Storm Water Management - Design approves non-standard specifications related to stormwater and has an application form for approval on its internet page. Many of the treatment BMPs in the PPDG require NSSPs, as the designs are new and standard special provisions have not been formally approved yet.

22.5.3 Reports/Project Documentation

The Design-Builder shall provide the Department with a Storm Water Data Report signed by a California-licensed Professional Engineer, which shall be a record of all drainage computations, both hydrologic and hydraulic, and all support data. Additionally the Design-Builder shall provide a drainage report documenting all the calculations required for the drainage design. The SWDR shall include all the pertinent stormwater information required in the PPDG, including the spreadsheets in the correct format for the Department to track the permanent treatment BMPs.

22.5.4 As-Built Plans

Upon completion of the Project, the Design-Builder shall deliver to the Department a complete set of As-Built Documents and design files that incorporate all design changes and details of Accepted Work that occurred throughout the Project including all permanent stormwater BMPs. The As-Built plans shall be signed by a licensed California Professional Engineer.

EXHIBIT 22-A

PID and PA/ED level SWDR information

All exhibits are provided as electronic files.