



Caltrans

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

PROJECT REQUIREMENTS

BOOK 2

I-15 Cajon Pass Rehabilitation

FOR DESIGN AND CONSTRUCTION ON STATE HIGHWAY

On I-15 from 0.44 mile north of Kenwood Avenue to 0.28 mile south of West Hesperia Overhead

DISTRICT 08, ROUTE I-15

CONTRACT NO. 08-0Q7404

08-SBD-I-15 PM R15.4/30.8

Project ID 08000204564

Federal Aid Project

XXXXXXXX

Dated: April 26, 2013

TABLE OF CONTENTS

1.	GENERAL	1-1
2.	PROJECT MANAGEMENT	2-1
3.	PUBLIC INFORMATION	3-1
4.	ENVIRONMENTAL COMPLIANCE	4-1
5.	[NOT USED]	5-1
6.	UTILITIES	6-1
7.	RIGHT OF WAY	7-1
8.	GEOTECHNICAL	8-1
9.	LAND SURVEYING	9-1
10.	EARTHWORK	10-1
11.	ROADWAYS	11-1
12.	DRAINAGE	12-1
13.	[NOT USED]	13-1
14.	LANDSCAPE	14-1
15.	[NOT USED]	15-1
16.	SIGNING, PAVEMENT MARKING, AND LIGHTING	16-1
17.	INTELLIGENT TRANSPORTATION SYSTEMS	17-1
18.	MAINTENANCE OF TRAFFIC	18-1
19.	MAINTENANCE DURING CONSTRUCTION	19-1
20.	[NOT USED]	20-1
21.	ROADWAY PAVEMENTS	21-1
22.	STORMWATER	22-1
23.	[NOT USED]	23-1
24.	[NOT USED]	24-1

EXHIBITS

Exhibit 1-A	Typical Cross-Section for Environmental Footprint
Exhibit 2-A	Quality Manual Template
Exhibit 2-B	Notice of Materials to Be Used Form (CEM – 3101DB)
Exhibit 2-C	Inspection Request Form (TL – 38DB)
Exhibit 2-D	Source Inspection Material Control Process
Exhibit 4-A	Project Document Environmental Commitments Record
Exhibit 4-B	Categorical Exemption/Categorical Exclusion Determination Form
Exhibit 4-C	Area of Potential Effect Map
Exhibit 11-A	Design Exception Process Flowchart
Exhibit 11-B	Typical Cross-Sections
Exhibit 12-A	District 8 Drainage Report Submittal Guidance
Exhibit 12-B	District 8 Drainage Report Format

Exhibit 14-A	Pesticides
Exhibit 16-A	Special Design Submittal Form
Exhibit 16-B	Special Design Submittal Guidelines
Exhibit 16-C	Pull Box Details
Exhibit 16-D	Sign Retro-Reflectivity Chart
Exhibit 16-E	Pictures of Existing Sign Panels to be Replaced
Exhibit 18-A	Lane Requirement Charts
Exhibit 18-B	Lane Requirement Chart Request Form
Exhibit 21-A	Joints, Terminals, and Bond Breaker Standards for Concrete Pavements
Exhibit 21-B	Pavement Policy Bulletin CP-1: Updates to Miscellaneous Indices in Highway Design Manual
Exhibit 21-C	Concrete Pavement Design Options
Exhibit 22-A	PID Stormwater Data Reports

1 GENERAL

1.1 General

The Design-Builder 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 Design-Builder 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.

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 project must maintain the existing horizontal and vertical alignments. This following constitutes the Basic Configuration of the Project:

- Horizontal and vertical alignment
- Lane and shoulder widths
- Number of lanes
- Location and number of roadway access points

1.3.2 Project Limits

The Project is located in Cajon Pass in southwestern San Bernardino County. The proposed roadway rehabilitation under pavement resurfacing and restoration (2R) project is to extend pavement service life with minimal maintenance expenditures. The Project limit is Interstate 15 (I-15) between 0.4 mile north of Kenwood Avenue and 0.3 mile south of West Hesperia Overhead.

The lateral limits of the Project are indicated in the typical cross-sections for environmental footprint (Exhibit 1-A) shall extend to the locations necessary to complete the Work and meet the Project requirements. Any temporary or permanent work outside the Project limits may require supplemental Governmental Approvals and a Supplemental Project Scope Summary Report in accordance with Section 7.5.4, "Identification of Additional R/W".

1.3.3 General Description

The project proposes to repair the existing Portland Cement Concrete Pavement (PCCP) by replacing (or overlaying with concrete) two outside lanes and existing AC patched areas to 40-year rigid pavement design. Inside lanes are to be rehabilitated by grinding and random concrete panel replacement with rigid pavement. Additionally, reconstruct inside and outside shoulders. This project also proposes to mill and overlay existing AC ramps, construct PCC ramp termini and upgrade recommended highway appurtenances and facilities.

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 I-15 Cajon Pass Rehabilitation (Project) will consist of designing and constructing the following improvements:

- A) Maintenance of traffic during construction,
- B) Rehabilitation of existing pavement:
 - Replace or overlay two outer Portland Cement Concrete Pavement (PCCP) lanes,
 - Reconstruct inside and outside shoulders,
 - Random Slab Replacement of interior lanes,
 - Ramp and brake inspection parking pavement rehabilitation,
 - Construct PCC ramp termini
- C) Replace dikes and upgrade to current standard
- D) Guardrail and barrier improvements,
- E) Upgrade sign panels,
- F) Provide construction surveying
- G) Coordinate with other construction projects within the corridor to maintain mobility,
- H) Coordinate with the local cities and county,
- I) Coordinate with Department's public involvement management team, including:
 - Development and implementation of a public information plan as part of the construction phase of this Project,
- J) Obtain necessary environmental permits and authorizations and/or prepare all required documentation for issuance of same, from federal and State agencies such as Regional Water Quality Control Board, and National Pollutant Discharge Elimination System (NPDES) permit, etc.,
- K) Maintain the roadway and roadway facilities within the Project limits during construction.

1.3.4 Cooperation

It is anticipated that work by other contractors may be in progress adjacent to or within the limits of this project during progress of the Work on this Contract. Should construction be under way by other forces or by other contractors within or adjacent to the limits of the work specified or should work of any other nature be under way by other forces within or adjacent to those limits, the Design-Builder shall cooperate with all the other contractors or other forces to the end that any delay or hindrance to their work will be avoided. The right is reserved to perform other or additional work at or near the site (including material sources) at any time, by the use of other forces.

When 2 or more contractors are employed on related or adjacent work, or obtain materials from the same material source, each shall conduct their operations in such a manner as not to cause any unnecessary delay or hindrance to the other.

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

Project EA08-341604 (I-15 at Ranchero Road – New Interchange) is anticipated to be completed in the summer of 2014. The Design-Builder shall plan their work schedule for work from post mile 29.0 to the northerly project limits so as to not commence until EA 08-341604 project has completed all work activities that impact I-15 freeway.

A list of ongoing contracts near to or within the Project limits includes but is not limited to:

- **Caltrans project EA 08-0K7104**
Modify Interchange, I-15 from 0.8 mile south of Glen Helen Parkway UC to 1.4 mile north of Kenwood Ave UC and on I-215 from 1.2 mile south of Devore Road OC to the I-15 junction
- **Caltrans project EA 08-3401U4**
Widening State Route 138 to 4 lanes from Interstate -15 to Phelan Road.
- **Caltrans project EA 08-341604**
Construct I-15/Ranchero Road Interchange
- **Caltrans project EA 08-0Q3004**
Construct SBd-138 Realign highway east of I-15.

EXHIBIT

Exhibit 1-A Typical Cross-Sections for Environmental Footprint

This exhibit is provided as an electronic file.

2 PROJECT MANAGEMENT

2.1 Scope Management

2.1.1 General

The Design-Builder shall perform all Work necessary to meet the requirements associated with Scope Management in accordance with the requirements of the Contract Documents and these Technical Provisions. In general, this includes 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, in accordance with the payment item breakdown on invoices and file structure for document control system according to the Caltrans Uniform Filing System for Design and the Caltrans Construction Manual for Construction..

The Design-Builder shall schedule, conduct, prepare, and distribute the minutes of all Project meetings for the duration of the contract.

2.1.3 Deliverables

The Design-Builder shall submit Project meeting minutes to the Department within seven Days or by the next regularly scheduled meeting for review and comments prior to making final.

2.2 Cost Management

2.2.1 General

The Design-Builder shall perform all Work necessary to meet the requirements associated with Cost Management in accordance with the requirements of the Contract Documents and these Technical Provisions. In general this includes 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.

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 twenty-first of the month and end on the twentieth day of the following 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 and Pay Item Breakdown
- 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
- Status of Submittals
- 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
- Payment for insurance and premiums will be made upon presentation of a paid invoice by the Design-Builder.

The Department makes the payments for Mobilization according to 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

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 Documents have been accepted by the Department.

The Department will base payments for Time Related Overhead on the number of Working Days that occurred during that monthly estimate period, including compensable suspensions and delays. Working Days granted by Contract Change Order due to Extra Work or changes in character of the work, will be paid for upon completion of the Contract. The amount earned per Working Day for time-related overhead shall be the amount for Time Related Overhead on Form 9 submitted with the Price Proposal divided by the number of Working Days in the Contract

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 and training records 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
 - A statement verifying continued compliance with the Quality Manual signed by the Quality Manager.
 - Summary of quality audits, Quality Control and Validation inspections and testing performed and summary of anticipated quality activities for the next month.
 - 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

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- Status of public utility work performed and required
8. Geotechnical (if necessary)
- 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. 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 copy in Adobe Acrobat (pdf) format.

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

2.3.1 General

The Design-Builder shall complete and maintain a "Primavera Project Planner" (P6) Project

Management Critical Path Method (CPM) Schedule

2.3.2 Administrative Requirements

2.3.2.1 Definitions

The following definitions used in this Section are intended to supplement or supersede definitions provided with Oracle Primavera P6 Professional Project Management for Windows and shall have the following intents and meanings:

- **As-Built Schedule:** A schedule that records actual dates, work days, non-workdays, re-work and/or out of sequence work.
- **As-Planned Schedule:** The schedule representing the Design-Builder's best judgment and intended plan for completion of the Work in compliance with Contract Documents. The as-planned schedule shall take into account all foreseeable activities; to include but not limited to activities by any separate contractors, interface dates with utility owners/railroads/municipalities/agencies, submittal and submittal review.
- **Baseline Schedule:** The first Accepted As-Planned Schedule, which incorporates activities developed in the Preliminary Schedule; and fully includes the entire scope of Work from NTP1 to Final Acceptance.
- **Controlling Item of Work:** The non-completed activity(s) with the earliest start date that resides on the Critical Path(s) of the current Working Schedule.
- **CPM Schedule:** Computerized Resource/Cost loaded schedule in CPM format.
- **CPM Format:** The structure of the computerized schedule. CPM Format defines the construction logic in terms of all of the activities with their logical dependencies. All activities shall be logically tied to a predecessor and successor with the exception of the first and last activities respectively.
- **Critical Activity:** An activity with zero or the most negative Total Float.
- **Critical Path(s):** The chain or parallel chain(s) of continuous activities controlling the last activity of the schedule and/or Milestone(s). See also Longest Path.
- **Date Constraint:** A constraint placed on an activity that overrides or impedes logic and/or restricts or distributes Float to control a network and/or sub-network of logic. A Date Constraint shall only be used on contractual obligate date(s).
- **Float:** The number of Days the start of an activity can be delayed without affecting a Milestone and/or the Project finish date. See also Total Float.
- **Free Float:** The number of Days available to an activity without delaying the early start of a successor activity. Free Float is uniquely available to an activity.
- **Impact Schedule:** A schedule prepared to demonstrate the impacts of a change, or a proposed change from the last accepted working schedule. An accepted Impact Schedule becomes the current Working Schedule and is submitted via a Time Impact Analysis.
- **Longest Path:** The Longest single path from the start of the schedule to the last activity of the schedule. See also Critical Path.
- **Milestone:** A contractual obligated Project Start or deadline and shall be designated with an activity type of Milestone. Milestones are the only activities allowed a Start and Finish date constraint. The Design-Builder may use activity coding to designate other activities of interest.
- **Near Critical Activities:** Activities with equal or less than 10 Days Total Float.
- **Preferential Sequence:** A sequence of Work chosen by the Design-Builder that otherwise could be performed in a different sequence than the one chosen.

- Preliminary Schedule(s): The schedule(s) submitted as parties work toward Baseline Schedule Acceptance.
- Revision Schedule: Any accepted schedule that substantially differs from the plan depicted in the accepted Baseline Schedule. An Accepted Revision Schedule becomes the current Working Schedule and is submitted via an Impact Schedule.
- Sequestered Float: The causation of a withdraw into seclusion to screen from view and make smaller a value of Float other than that as shown in the schedule as a result of manipulation and techniques of network logic intentional or unintentional, that diminishes, sequesters or removes Float that would otherwise be available to both parties.
- Total Float: Number of Days by which a part of the Work in the Schedule may be delayed from its Early Dates without necessarily extending the Contract Time or Milestone. See also Float.
- Two Week Look-Ahead Schedule: Schedule which spans a forward looking, rolling period of at least 14 Calendar Days.
- Working Schedule: The current accepted Schedule. The Working Schedule shall be used for planning the remainder of the Work, as well as recording actual start/finish dates of activities, and work/non-work days.

2.3.2.2 Computer Software

The Design-Builder shall submit to the Department for review a description of proposed schedule software to be used. After the Department accepts the proposed software, the Design-Builder shall furnish one copy of schedule software and all original software instruction manuals. All software must be compatible with the current version of the Windows operating system in use by the Department. The schedule software must be the latest version of Oracle Primavera P6 Professional Project Management for Windows, or equivalent.

If a schedule software equivalent to P6 is proposed, it must be capable of:

1. Generating files that can be imported into P6
2. Comparing 2 schedules and providing reports of changes in activity ID, activity description, constraints, calendar assignments, activity duration, and logic ties.

The Design-Builder is responsible for any conversion discrepancies.

The schedule software and schedule-comparing software will be returned to the Design-Builder before the final estimate.

Instruct the Department in the use of the software and provide software support until the contract is Accepted. Within 15 Days of contract Approval, provide a commercial 8-hour training session for up to 6 Department employees in the use of the software at a location acceptable to the Department. It is recommended that Design-Builder also send at least - four (4) employees to the same training session to facilitate development of similar knowledge and skills in the use of the software. If schedule software other than P6 is submitted, then the training session must be a total of 16 hours for each Department employee.

2.3.2.3 Schedule Calculations

The following scheduling settings will govern, and the schedule will be calculated in P6.

2.3.2.3.1 Interruptible Activities

The schedule method shall be set to interruptible activities.

2.3.2.3.2 Total Float Calculations

Total Float shall be calculated utilizing the Finish Dates. Hammocks will be ignored when determining Float and Critical Path(s).

2.3.2.4 General Requirements

Changes to the Schedule shall be closely coordinated with the Department and are subject to the Department's Acceptance. If the Department deems Work is performed substantially out of sequence, the Department may request the Design-Builder to demonstrate the impacts in accordance with the Time Impact Analysis (TIA) section contained herein.

The Design-Builder shall manage and Work with each Subcontractor and Supplier to obtain information on Activities for implementation and sequencing of the Work. The schedules shall reflect Contract requirements and known limitations.

Errors or omissions within schedules shall not relieve the Design-Builder from finishing all Work within the time limit specified for completion of the Contract. After a schedule has been Accepted by the Department, and either the Design-Builder, or the Department discovers that any aspect of the Schedule has an error or omission, it shall be corrected, and the effects indicated in accordance with the Time Impact Analysis section contained herein.

Any condition or Work that impacts the Design-Builder's commencement of an activity shall be identified as outside impacts to the Schedule, such as work under another contract, which affects the Project. In a case where Work affects or is affected by work under another contract and the affected contracts are being performed by the same contractor, the Design-Builder shall coordinate the Work to minimize impacts to both contracts' project completion dates. No additional time shall be given for coordination with other contracts.

2.3.2.5 Naming Convention

2.3.2.5.1 Preliminary and Baseline Schedule

Schedules shall be assigned a file name and a version, starting with file name "BL00" and version "Rev. 0". Until the Department accepts the schedule the Design-Builder shall resubmit the same file name and increment the version number by one (e.g., BL00 Rev1). The Preliminary Schedule that is ultimately accepted as the Baseline shall be resubmitted with file name of "BL00" and a version "Baseline". Updates shall increment the file by one with version starting back at "Rev 0" and versions incremented by one until accepted (e.g., BL01 Rev0).

2.3.2.5.2 Impact Schedule

Impact Schedules are submitted via a Time Impact Analysis in accordance with the "Time Impact Analysis" section contained herein. Impact Schedules shall be assigned a file name starting with file name "I001" and incremented by one for every submitted Impact Schedule.

2.3.2.5.3 Revision or Recovery Schedule

The first accepted Impact Schedule (new Working Schedule) shall be assigned a file name starting with file name "RE00"; however, the revision shall indicate the accepted Impact Schedule's file name (e.g., file name RE00 RevI001). Subsequent updates shall have a file name incremented by one, with revision started back at "Rev.0" (e.g., RE01 Rev0).

2.3.2.6 Notice to Proceed(s)

2.3.2.6.1 Preliminary Schedule(s)

All schedules submitted prior to Acceptance of the Baseline Schedule will be considered Preliminary Schedules. The first Preliminary Schedule shall communicate that all Milestone dates are understood and sufficiently detail a 30-Day look-ahead period. The Design-Builder shall continually improve upon the Preliminary Schedules and shall show the status of work actually completed until it is accepted as the Baseline. Preliminary Schedules shall be submitted with data dates of the 21st day of the month; the schedule shall be submitted to the Department as soon as possible after the applicable data date, but in no instance shall be later than four Calendar Days after applicable data date.

2.3.2.6.2 Baseline Schedule

The Baseline Schedule shall not extend beyond any Completion Deadlines, contain negative Float, or utilize any other prohibited scheduling techniques. A total of not more than 20 percent of the Baseline Schedule activities shall be Critical Activities or 30 percent Near Critical Activities, unless otherwise authorized by the Department.

The Baseline Schedule shall include, at a minimum, the applicable level of detail indicated in the “Level of Detail” section contained herein, unless changes are approved by the Department. Failure to include any element of required Work in any Schedule shall not relieve the Design-Builder from completing all Work necessary to complete the Project according to Completion Deadlines.

2.3.2.7 Schedule Updates

At a minimum, the Design-Builder shall submit an updated schedule, with a data date of the 21st day of the month or other date established by the Department, which accurately records the dates work was started and subsequently completed. The schedule should be received, by the Department, as soon as possible after the applicable data date, but in no instance shall it be later than four calendar days late. Changes to the Schedule shall be closely coordinated with the Department and are subject to the Department’s acceptance. If the Department deems work is performed substantially out of sequence, the Design-Builder shall demonstrate the impacts in accordance with the “Time Impact Analysis” section contained herein.

The Design-Builder shall minimize the number of changes and state within the update narrative, the reasons for any changes to the Schedule. The Department may elect to allow the Design-Builder to include modifications such as adding or deleting activities or modifying activity descriptions, durations or logic without submitting a “Time Impact Analysis” as long as, in the sole opinion of the Department, the modifications do not:

- Alter the critical path(s) or near critical path(s)
- Extend the scheduled Completion Deadlines or Milestone(s) compared to that shown on the current accepted Working Schedule
- Disrupt the integrity or comparative relationship between the last accepted Working Schedule
- Consume “unreasonable” amount of Total Float
- Modify Budget Estimates on In-Progress Activities
- Delete In-Progress Activities with Budget Estimates

The Design-Builder shall minimize the number of changes and state in writing, within the update narrative report, the reasons for any changes to the Schedule or planned work. If, in the opinion of the Department, any proposed changes in planned work result in any of the above stated conditions, the Design-Builder shall submit a “Time Impact Analysis” as described herein.

2.3.2.8 Acceptance of Schedule

The Department’s review and acceptance of Schedules will not waive any Contract requirements and shall not relieve the Design-Builder of any obligation or responsibility for submitting complete and accurate information. By review and acceptance of the Schedule, the Department does not endorse or otherwise certify the validity or accuracy of any part of the Schedules. The responsibility for validity and accuracy of all Schedules is the sole responsibility of the Design-Builder. Errors or omissions within Schedules shall not relieve the Design-Builder from finishing all Work within the time limit specified for Completion Deadlines.

If, after a Schedule has been accepted by the Department, and either the Design-Builder or the Department discovers that any aspect of the Schedule has an error or omission, it shall be corrected and the effects indicated in accordance with the “Time Impact Analysis” section contained herein.

Errors or omissions within schedules shall not relieve the Design-Builder from finishing all work within the time limit specified for completion of the Contract. After a schedule has been Accepted by the Department, and either the Design-Builder, or the Department discovers that any aspect of the Schedule has an error or omission, it shall be corrected and the effects indicated in accordance with the “Time Impact Analysis” section contained herein.

2.3.2.8.1 Preliminary and Baseline Schedules

The Department will accept or return comments on submitted schedules within seven (7) Calendar Days after being received. Schedules that are not accepted shall be corrected by the Design-Builder within seven (7) Calendar Days after the Department has returned comment. It is the Design-Builder’s responsibility to meet with the Department as often as necessary to satisfy the Department’s comments within said seven (7) Calendar Days.

2.3.2.8.2 Schedule Updates

The Department will accept or return comments on submitted schedules within seven (7) Calendar Days after being received. Schedules that are not accepted shall be corrected by the Design-Builder within seven (7) Calendar Days. It is the Design-Builder’s responsibility to meet with the Department as often as necessary to satisfy the Department’s comments within said seven (7) Calendar Days. All Change Orders shall be incorporated into the Schedule Updates by separate activities with Approved Costs and Resources. All Change Orders must be coded appropriately by Change Order number and appropriate activity coding.

2.3.2.8.3 Impact Schedules

The Department will accept or return comments on submitted schedules within 14 Calendar Days after being received. Schedules that are not accepted, shall be corrected by the Design-Builder within seven (7) Calendar Days. It is the Design-Builder’s responsibility to meet with the Department as often as necessary to satisfy the Department’s comments within said seven (7) Calendar Days.

2.3.2.9 Weekly Look-Ahead Schedule

The Design-Builder shall submit weekly, a detailed forward looking schedule, covering the period of at least 14 Calendar Days. This schedule may be a hand- or computer-generated bar chart, but specifically references the applicable CPM Activity ID. This Look-Ahead Schedule” shall be in greater detail than the “Working Schedule” and define specific daily operations at each specific location to be performed during the two-week period.

2.3.2.10 Schedule Recovery

Unless otherwise directed in writing by the Department, whenever the current working schedule indicates negative Float greater than 5 percent of the remaining Calendar Days before a contractual obligate milestone, but in no case greater than negative 20 Working Days, the Design-Builder shall submit, within seven Calendar Days, a Time Impact Analysis (TIA) as described in “Time Impact Analysis” section herein; whereas the impact schedule shall recover the negative Float regardless of fault of either party for past delays. The requirement to recover negative Float regardless of fault is not a directive by the Department to accelerate the Work but rather a directive to provide a proposal. Any cure involving acceleration, at a cost to the Department, shall be directed in writing from the Department prior to any execution of acceleration thereof.

2.3.2.11 Change Management

The Design-Builder shall provide the Department with the schedule activity(s) that were affected and document them in the appropriate Change Order. All Change Orders shall be incorporated into the schedule. Each Change Order shall have its own activity ID and specifically reference the Change Order Number as the P6 Resource; and be assigned to a cost account “CO”. All change orders shall include TIA and any additional time shall be accompanied with the change order.

2.3.2.12 Time Impact Analysis

The Design-Builder shall determine the effect of an impact as contemporaneously as possible, and shall not wait to analyze the effects of an impact; this may require estimates of the duration of the impact. The Design-Builder shall submit a Time Impact Analysis (TIA) at any time the Design-Builder is unsure if any one event, or accumulation of events, impacts a Completion Deadline. Failure of the Design-Builder to submit a TIA addressing the impact, will be considered prima facie evidence that the Department was not afforded the opportunity to mitigate the impact. At any time the Department may require the Design-Builder to demonstrate the impacts of any change, or proposed change, to the schedule via (TIA) and shall submit within seven Calendar Days of receiving the request, even if the Design-Builder believes that there is no impact to the schedule.

A Time Impact Analysis (TIA) shall include a statement that there is “No effect to the schedule” OR, the (TIA) shall include the following:

- An Impact Schedule
- Any associated cost burden or savings
- A narrative report developed specifically to demonstrate effects of deviations from the current working schedule to include:
 - A detailed factual statement of the impact, and its cause, providing all necessary dates, locations, and items of Work affected and included in each impact
 - The dates or dates on which actions resulting in the impact occurred or conditions resulting in the impact became evident
 - Identification and copies of all pertinent documents relating to such impact
 - Basis for entitlement and identification of the provisions of the Contract which support the impact
 - All, if any, concurrent Design-Builder caused delays during the time frame of the impact
 - Affected activity ID(s) of the Schedule for which the impact is to be presented and how they were affected
 - Any additional information requested by the Department

The Department may accept the Impact Schedule as the new Working Schedule while parties determine associated cost burden or savings. All accepted Impact Schedules shall become the next Working Schedule and with the Impact Schedules file name referenced in the Revision field.

2.3.2.13 Float Suppression / Sequestered Float / Use of Float

The Design-Builder shall not engage in Float suppression manipulations which have the net effect of sequestering Float time. It is expressly agreed and understood that the Design-Builder shall not be entitled to any compensation or damages on account of delays which could have been avoided by revising activity time or logic used to sequester Float and will exclude the Design-Builder’s right to recover any delay damages or compensation. Lags/Leads are subject to the consent of the Department. The Design-Builder shall remove any Lags/Leads and replace them with an activity identifying the Lag/Lead upon request of the Department, regardless of prior Acceptance on previous schedules

The Design-Builder acknowledges that all Float is a shared commodity available to the Project and is not for the exclusive benefit of any party, but is an expiring resource available to accommodate changes in the Work, however originated. Contract time extensions for Contract performance will be granted only to the extent that delays or disruptions to effected work paths exceed Total Float along those paths of the current Working schedule in effect at the time of delay or disruption. It is understood that identified contingencies, as described in the “Calendar and Identified Contingency” section, become available Total Float as time elapses and the contingency was not used.

2.3.2.14 Early Completion

Should the Design-Builder intend to complete, or complete the Work, or any portion thereof, earlier than any Completion Deadline, it is understood that Project benefits from the increase in shared Total Float. The Design-Builder agrees that delays shall only be based on impacts to the Completion Deadlines, not the Planned Early Finish date of the Schedule. Completion Deadlines can only be changed by an executed Change Order.

2.3.2.15 Calendars and Identified Contingency

The duration of each activity shall include the necessary work days to actually complete the work defined by the activity; contingency shall not be built into the durations. Each activity shall be assigned the appropriate calendar as it relates to each major item of Work. Each calendar, with the exception of the calendar utilized for tracking Calendar Days, shall include contingent non workdays. It is the responsibility of the Design-Builder to estimate sufficient weather contingency. The Design-Builder shall include a minimum of 15 percent weather contingency for each major item of Work affected by weather. The Design-Builder shall submit a statement indicating duration (in hours) of their normal work day as it relates to the work week (e.g., M-F [10 hrs] and Sat [6 hrs] for each calendar). Contingency will be the amount of indicated non workdays compared to this statement. If the Design-Builder does not submit this statement it will be considered prima facie evidence that the Design-Builder did not account for sufficient weather impacts.

2.3.2.16 Non-Compliance

The Design-Builder's refusal, failure, or neglect to diligently pursue timely acceptance of any schedule or TIA shall constitute reasonable evidence that the Design-Builder is not prosecuting the Work, or separable part, with the diligence that will ensure its completion within the applicable Completion Deadline and shall constitute sufficient basis for the Department to exercise one or a combination of the following options: withhold an amount up to 100 percent of the estimated value of work performed, or assess a non-recoverable monetary deduction of \$1,000/Day for every Day past an applicable schedule submittal deadline stated herein.

2.3.2.17 Level of Detail

The Schedule shall be both cost and resource-loaded, and will be used to administer the payments to the Design-Builder. If the Design-Builder intends to bill for materials on hand, all procurement activities must be scheduled and cost/resource loaded separately from the installation activities.

The costs assigned to schedule activities shall roll up to equal the price for the items identified in Form 9 of the ITP. The total cost of all schedule activities shall equal the Contract Price. The cost assigned to individual schedule activities shall reflect the Design-Builder's cost for each activity, and shall not artificially inflate, imbalance, or front-load the items. Each activity shall identify a reasonable estimate of either a commodity or labor hour upon which the activity value is based. Combining multiple Resource/Cost Account codes on single activities is not allowed (i.e., "Install Soundwalls" should not include both Painting and Installation cost/resources).

As a minimum each activity shall:

- Have a unique activity description, which appropriately describes the work to be performed.
- Not be less than one day in duration. Have at least one predecessor and one successor activity, except for Project start and finish, respectively
- Express activity duration in Days
- Utilize the Activity Code "DETL" to best represent a geographic area of the project. The DETL code field shall be shorter than 5 characters

The Baseline Schedule shall be sufficiently detailed to accurately reflect the complexity and numerous construction operations of this Project to the satisfaction of the Department. The level of detail described below is an example of the kind of detail expected, but can be improved upon or changed as applicable.

Administration:

- Schedule Milestones
- Mobilization
- Foundations, substructure, superstructure, and decks
- All Submittals (Design packages, shop drawings, etc)
- Department review periods
- Utility notification and relocation, by utility
- Material on hand (procured items) requests and payments
- Substantial completion
- Punch list

Bridges:

- Test piling
- Test holes
- Embankment for each abutment location
- Fabrication and delivery of piling
- Structural steel fabrication and delivery, per structure
- Pile installation, per bent, per structure
- Drilled shaft installation, per pier, per structure
- Pile caps, per bent, per structure
- Footings, per pier, per structure
- Columns, per pier, per structure
- Caps, per pier, per structure
- End bents, per structure
- Beam or girder erection, per structure
- Diaphragms
- Deck placement, per structure
- Parapets, per structure
- Erection and removal of falsework and shoring

Roadway:

- Traffic switches
- Submission of job mix formula for asphalt pavement
- Delivery schedule for items such as drainage pipe, guardrail, sign structures and signs, permanent lighting facilities, and permanent traffic signals
- Internal access and haul roads (location and duration in-place)
- Clearing and grubbing by stationing and roadway
- Excavation

-
- Embankment placed for each roadway
 - Drainage – by run with structures for each roadway
 - Retaining walls per location
 - Subgrade for each roadway
 - Base for roadway
 - Curb, barrier wall and sidewalks for each roadway
 - Pavement (asphalt and/or concrete) for each roadway
 - Bridge approach slabs per location
 - Guardrail for each roadway
 - Slope pavement or riprap
 - Roadway lighting for each roadway
 - Signing for each sign structure location and for each roadway
 - Striping for each roadway
 - Traffic signals per location
 - Topsoil, sodding, seeding and mulching for each roadway
 - Landscaping
 - Finishing roadway and final cleanup

2.3.3 Deliverables

2.3.3.1 Schedule Submission

The Design-Builder shall include a narrative for each schedule submittal to include and discuss:

- A bar chart, of all activities, sorted by Early Start and indicating Longest Path(s) in red
- A bar chart sorted by Early Start for each Milestone's Critical Path
- A bar chart, of only activities with Total Float less than ten (10) Days, sorted by Early Start
- Upcoming and pending coordination required with the Department, or third parties
- Potential problem areas
- Description and reason for any changes made to the schedule and the effects the changes have on Milestones or Project Completion Date including schedule recovery

The Design-Builder shall include Bar Charts for each Schedule submittal containing the following information:

- The Baseline Schedule in grayscale above the current progress bar for each task
- Activity ID and description
- Original Duration
- Remaining Duration
- Percent Complete
- Early Start, Early Finish, Late Start, and Late Finish.
- Activity Float and Total Float
- Predecessors and successors
- Include a title block and a timeline on each page. At a minimum, the title block shall include file name, revision, start date, finish date, data date, and run date.

One CD-R compact disk containing a backup, in P6 compressed format (PRX files).

2.3.3.2 Preliminary Schedule

The Design-Builder shall submit to the Department a Preliminary Schedule for Acceptance. Acceptance of the first Preliminary Schedule shall be a condition of NTP1.

2.3.3.3 Baseline Schedule

The Design-Builder shall submit a Baseline Schedule for the Department Acceptance within 21 Calendar Days following NTP 1.

2.3.3.4 Schedule Updates

The Design-Builder shall submit an updated schedule, with a data date of the 21st day of the month, or other date established by the Department, that accurately records the dates the Work started and subsequently completed. The schedule shall be submitted as soon as possible after the applicable data date, but in no instance shall be later than four Calendar Days.

2.3.3.5 Time Impact Analysis

The Design-Builder shall submit a TIA to determine the effect of any delay event or any ordered or proposed change to the current Working Schedule. A TIA includes an Impact Schedule, any associated cost burden or savings, and a narrative report developed specifically to demonstrate effects of deviations from the current working schedule.

2.3.3.6 Weekly Look-Ahead Schedule

The Design-Builder shall submit weekly, a detailed forward looking period of at least 14 Calendar Days. This schedule may be a hand- or computer-generated bar chart, but specifically references the applicable CPM Activity ID.

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 management 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). The Design-Builder shall be responsible for Quality Control and Quality Validation as defined below and described in the Quality Manual:

Quality Control: All Design-Builder/Subcontractor/Supplier/Vendor operational techniques and activities (process controls) that are performed or conducted to fulfill the contract requirements.

Quality Validation: Design-Builder's activities that are independent of Quality Control and are performed by the Quality Manager or their representatives to ensure the quality of the product.

2.4.1.2 Department Role

The Department will assure that the Work is in conformity with the requirements of the Contract by performing verification sampling, testing, and inspection as part of the Acceptance and Independent Validation Program. The Department will use Contractor's Quality Control (QC) & Quality Validation (QV) results as part of the acceptance as well.

The Department will provide oversight of the Design-Builder's Quality Program..

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

- 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.
- Construction verification sampling, testing, and inspection as part of its Acceptance Program. The Department will provide formal Acceptance of Work by performing verification testing at critical activity points. The Department may also perform verification inspection at the source.
- Management Program auditing of the implementation of the Design-Builder's management plans and Quality Manual. These audits will be systematic and independent 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 quality staff may perform inspections or take samples for further investigation of possible Nonconforming Work

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 and describe it in the Quality Manual 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 Validation 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 Control and Quality Validation staff understand their role in determining 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

The Design Builder shall perform the Work 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 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 contract change order.

- Special Provisions*
- Caltrans Standard Specifications
- Standard Plans
- Department Technical Memoranda
- Caltrans *CADD User Manual**
- Remaining standards set forth in Book 3

*Document modified for design-build.

2.4.2.2 Quality Approach

2.4.2.2.1 General

The overall quality approach defined by this Section requires the Design-Builder to develop, implement, and maintain a Quality Program that encompasses the overall project, the design and the construction quality, 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 in accordance with these quality plans.

The Design-Builder shall perform Quality Control and Quality Validation activities for the design and construction of the Project in accordance with the policies and procedures defined in the Quality Manual described in Section 2.4.2.5. The Design-Builder's Quality Control activities shall include, but not limited to, the total of all design and construction activities to ensure that a product meets Contract requirements. The Quality Validation activities shall include, but not limited to, all systematic monitoring and evaluation of various aspects of the Project to ensure the standards of quality are being met, thereby providing confidence that all Work complies with the Contract and that all materials incorporated in the work, all equipment, and all elements of the Work will perform satisfactorily. The Design-Builder shall perform design quality check and review to ensure that the Work meets Contract requirements. The Design-Builder shall also perform construction quality testing and inspection activities to ensure that materials and the constructed Work meet Contract requirements. The quality tests and inspections shall be in accordance with the policies and procedures defined in the Quality Manual. The Design-Builder's Quality Validation (QV) team personnel shall be independent from and have no responsibilities in the production of the Work. . There should be a clear separation between QC and QV staff, and QV staff would work for and report to the Quality Manager.

The Department's Acceptance Program includes sampling, testing, and inspection to evaluate conformance of the Work with the Contract requirements. The Department will perform contract acceptance testing and inspection for verification that the Work meets Contract requirements.

The Department's oversight role is to perform reviews and audits of the design and construction products, and the Design-Builder's Quality Control and Quality Validation activities. The Department will perform oversight activities that are an unbiased and independent audits and evaluation of all the technical checks, sampling, and testing procedures and equipment calibration. .

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 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.

2.4.2.2.2 Withholding of Payment and Work Suspension

If there is evidence that the Design-Builder is not following approved quality procedures as evidenced by the Department's Acceptance Program activities or problems arising 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 deficient work that requires correction of design and/or construction defects.

When there is conflict between the Design-Builder QC/QV and the Department Acceptance testing results, the Department will initiate a dispute resolution process. The Department Materials Engineering and Testing Services (METS) will act as the arbitrator for the dispute resolution.

In addition, the Department may deduct from any amounts otherwise owing to Contractor, including each progress payment and the final payment, any additional costs borne by the Department to address lapses to the Design-Builder team's quality management system, as specified in see Section 11- Book 1.

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 Control of Material

The Design Builder shall furnish the Department a list of the Design Builder's sources of materials and the locations at which those materials will be available for inspection within seven (7) days after NTP 2. The list shall be submitted on the form shown on Exhibit 2-B, Notice of Materials to Be Used Form (CEM-3101DB), and shall be furnished to the Department within the required time as listed on Exhibit 2-C, Inspection Request Form (TL-38DB) to permit inspecting and testing of materials to be furnished from the listed sources in advance of their use. The Department will perform verification inspection and testing at the source.

The Design-Builder Quality Validation Manager (QVM) will be primarily responsible for material management and the Department will be copied on all the correspondences.

The Design-Builder shall perform Source Inspection and Fabrication Quality Control and Quality Validation on materials or products that will be used in all phases of the project and that are produced or fabricated at locations outside the construction site.

The Department may inspect, sample, or test materials at the source of supply or other locations, but the inspection, sampling or testing will not be undertaken until the Quality Control and Quality Validation personnel working on behalf of the Design Builder have completed their quality checks and the Department is assured by the Design Builder of the cooperation and assistance of both the Design Builder and the supplier of the material. The Design Builder shall assure that the Department or the Department's authorized representative has free access at all times to the material to be inspected, sampled, or tested. The necessary samples for destructive testing will be provided at the Design Builder's expense.

The Department shall be allowed to record, including photograph and video record, to ensure a material is produced to comply with the Contract. It is understood that the inspections and tests if made at any point other than the point of incorporation in the work in no way shall be considered as a guaranty of acceptance of the material nor of continued acceptance of material presumed to be similar to that upon which inspections and tests have been made. The Department's Verification sampling, testing, and inspection as part of its Acceptance Program is the prerogative of the Department and does not relieve the Contractor of responsibility for Quality Control and Quality Validation.

The Design Builder shall furnish all samples selected by the Department for the Department's verification and shall allow reasonable time to perform Contract Acceptance Testing (CAT)

For any materials/products that are shown on the Department's Pre-Qualified Authorized Materials List, the Design Builder shall only utilize suppliers of such products that are on the list. See the Department's Materials Engineering and Testing Services (METS) website for the Authorized Materials List.

Where required by the specifications, materials/products should be fabricated at a location that has passed a Department audit, the Design Builder shall only utilize an audited/authorized facility that resides on the latest Department Audited Facility List. See the Department's Materials Engineering and Testing Services (METS) website for the latest list of Audited Facilities.

2.4.2.4 Quality Manual (QM)

2.4.2.4.1 Quality Manual – General

The Design-Builder's Quality Program shall comprehensively be described in 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 Executive Committee.

The Department shall approve the Quality Manual prior to any work and is a requirement for issuing NTP 1, 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 Department identifies a systemic problem. These revisions shall be approved 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.

2.4.2.4.2 Quality Manual – Template

To aid the Design-Builder with development of the Quality Management Plan 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 Management Plan 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 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 Management Plan 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

2.4.2.4.3 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 Contract requirements.
- Be the point of contact to resolve non-conformances and project quality issues with Department.
- Report to the Design-Builder’s Executive Committee and be independent of the Design-Builder’s Project Manager.
- Provide the Department Contract Manager with all the reports and documents generated under the contract.
- Have the authority to stop work.
- Be a registered Professional Civil Engineer in the State of California.

Following are the minimal certification requirements for inspection personnel performing quality control and validation activities at the listed assignments.

Type of Inspections	Minimum Required Certifications
Precast plant inspectors	PCI level II or PE
Welding and Misc Steel Inspections	AWS CWI For fracture critical work AWS CWI with FCM experience
Non-Destructive Testing Inspections	ASNT TC- 1A NDT Level II For Fracture critical work ASNT NDT Level III should be available
Paint/Coating Inspections for Structural Elements	NACE Level III
Concrete Field Inspections	ACI Field Grade I
Concrete Lab Inspections	ACI Lab Grade I or Aggregate Grade II as applicable

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. The Design-Builder’s Quality Validation personnel shall be independent from and have no responsibilities in the production of the Work.

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 and Lead Structure Inspectors shall be registered Professional Engineers in the State of California and 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 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 Department to participate in the management reviews.

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

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

2.4.2.4.4 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. Any non-standard designs, details, manuals, or documents other than those approved by the Department shall be submitted to the Department for approval prior to being used for design or the preparation of structure plans.

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.

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

Design Input

The Quality Manual shall also 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 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 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 *Caltrans Plans Preparation Manual* (PPM). Variations may result due to design-build delivery. The Design-Builder shall meet with 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 MicroStation V8 version.
- The Design-Builder shall ensure that CAiCE is used for design, unless otherwise specified by Department.
- The Design-Builder shall ensure that all deliverables containing CADD data shall be in MicroStation, see Section 4.1 of *Caltrans CADD Users Manual*, or CAiCE format for design deliverables, see Sections 3.6 and 3.7 of the *Caltrans 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 *Caltrans 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 Materials Control Schedule (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 (RFC) packages and include the following (at a minimum)

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 *Caltrans 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 *Caltrans Standard Specifications* prior to being issued for construction.

The Design-Builder shall consult with 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 Validation Manager, Caltrans *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 and this section and shall be subject to review by the Department. 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 Department.

Approved shop or working drawings and submittals listed in the specifications such as WQCP, PCQCP, PQWP, Splice Prequalification Report, Mix Design, etc. shall be provided to the Department the number of Working Days allowed in “Department Review Time Requirements” prior to the start of any construction or fabrication detailed by those drawings. The Department approval/concurrence is required prior to start of any work. The Design-Builder shall make no changes in any approved shop or working drawing after the Engineer Of Record 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 Department As-Built Documents 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 Caltrans *CADD Users Manual* and the Caltrans *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 provide both the design and the independent structural check calculations.
- The Design-Builder shall provide bridge load rating calculations and information.
 - 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 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.

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 of 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 Department by revising the design and/or plans to Department's satisfaction.

Over-the-Shoulder Reviews

Over-the-shoulder reviews are informal examinations by 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 Department or the Design-Builder. The reviews may, at 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 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 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 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 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 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, date, time, and location.
- 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 Department, the Design-Builder is not meeting the goals and objectives of the Quality Manual, the Design-Builder shall suspend all Project work and 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 Department before Acceptance. The Department review timelines above start 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. 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. 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 Validation Manager for review and approval prior to submitting the RFC Documents for 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 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 Department and applicable government entities, Utilities, and Railroads Accept the Plans. Construction of any item, element, or phase covered by the Design Quality Validation 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 Department's concurrence. Any subsequent phases of design to be Released for Construction shall be checked and approved by the Design Quality Validation 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 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 Validation Manager or 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 Validation Manager's review process or 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 Validation Manager's review process and 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 Department into the design documents.

Upon completion of the Design Quality Validation Manager's review, the Design-Builder may forward such re-submittals to Department for review and comment. If the Department requests additional information during review of the re-submittal, the Design Quality Validation 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 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 the Department allowed per week and per type are as follows:

Design Plans	2
Structure Plans	2
Other Reports/Plans	2

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.

2.4.2.4.5 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 Validation Inspection and Testing Plan in Exhibit 2-A Quality Manual Template, Volume 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 managed 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 Validation personnel and 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 (Exhibit 2- A Quality Manual Template, Volume III) 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. Both QC and QV laboratories shall be separate as well as accredited as following:
 - Concrete, Asphalt, Aggregate, Soil- AASHTO Accredited
 - Structural Steel, Rebar etc – A2LA Accredited
- 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 in Exhibit 2- Quality Manual Template, Volume III.

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 the 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 are 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 Validation 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 Design Builder will be taking samples for their Quality Validation and Department may select additional samples at the Design Builder's expense. The sample shall be delivered to the Department's designated laboratory by the Design Builder

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. The Design-Builder's Quality Validation team shall conduct Quality Validation inspection that includes, but not limited to:

-
- Representative inspection of all quality control functions
 - Periodic verification inspections of the materials, welding, and fabrication
 - Periodic sampling and testing of materials
 - Non-destructive testing (NDT) and verification inspection.
 - Intermediate and final release inspections. Release inspections will be documented.
 - Participating in Pre-welding and Pre-precast meetings.

Quantities and Production Tracking

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

The Design-Builder will record all labor and equipment on an hourly basis. The recording of labor will include the name and labor classification for each individual and assigned to a specific item of work corresponding to the Contractor's approved schedule. The recording of equipment will include the company equipment number, type, and classification of equipment for each piece of equipment and assigned to a specific item of work corresponding to the Contractor's approved schedule.

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.

2.4.2.4.6 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 as Volume IV of the Quality Manual Template (Exhibit 2-A), 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. Specifically elaborate on how 3101DB are responded for items that are source and/or jobsite inspected. Also, explain how each material item will have corresponding source and/or field release records for final acceptance
- 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 trackable (e.g., documents using the redline/strikeout method).

2.4.2.4.7 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 validation activities. This will include the taking of samples for the purposes of testing at Design Builder’s expense, the examination of records, and interviews with personnel from the Design-Builder’s organization and all Subcontractor and Supplier organizations. The Design-Builder shall allow reasonable time to perform these verification activities.

The Design-Builder shall not use the results of validation 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 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 Plan 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 Plan, 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 Calendar 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 Calendar 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 Acceptance 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 Validation 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:
 - a) MicroStation and/or CAiCE files, including all drawings and data files used to create the RFC Documents.
 - b) 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 Acceptance two complete hardcopies of all As-Built Plans and one set 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 Caltrans *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 Acceptance of the As-Built Documents must be granted by the Department before finalization of the Contract. Upon Acceptance, the Design-Builder shall upload electronic versions of all As-Built Documents, in native and PDF format into DCS.

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

Key Personnel for the Project shall include the following:

- Design-Builder's Project Manager
- Quality Manager
- Design Manager
- Construction Manager
- Design Lead Engineer – Roadway (Engineer Of Record)
- Project Scheduler
- Environmental Compliance Manager
- Safety Manager
- Traffic Manager

2.5.2.2.2 Minimum Requirements of Key Personnel

The following provides a brief job description and minimum requirements of the Key Personnel assigned to the Project. All Key Personnel will be required to be available to the Project Site during activities that involve their areas of responsibility.

The following provides a brief job description and minimum requirements of the Key Personnel assigned to the Project.

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.
- Must be present at the site of work at all times
- Shall have fifteen (15) years experience managing complex infrastructure projects
- Shall have ten (10) years experience managing the design and construction of major urban freeway projects
- Shall have five (5) years of project management experience in design-build on major urban freeway projects

- Shall have recent experience as Project Manager for design and construction of highway projects similar in scope and complexity
- License as Professional Civil Engineer in California preferred, but not required

Quality Manager

- Shall be responsible for developing and implementing the Quality Control/Quality Validation program, responsible for overseeing the day-to-day quality aspect of design, 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.
- Experience as Quality Systems and Program Manager and recent experience in quality management of design and construction of highway projects similar in scope and complexity are required.
- Shall work independently of the Design and Construction teams, shall not have any production-related responsibilities and report directly to 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
- Reviews contract documents for adherence to quality and testing requirements.
- Shall have the authority to stop any and all Work that does not meet the Contract requirements.
- Recent experience in quality management of design and construction of projects similar in scope and complexity
- Shall have fifteen (15) years of recent experience managing complex infrastructure projects
- Shall have five (5) years of major design-build construction management of major urban freeways,
- Must be a registered Professional Engineer in the State of California.

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 have five (5) years of major design-build project management of major urban freeway systems.
- Shall have ten (10) years of recent experience in managing the design of major urban freeways
- Shall have fifteen (15) years of experience managing complex infrastructure projects.
- Must be a registered Professional Civil Engineer in the State of California now or by the time the initial notice to proceed is issued
- 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 recent experience in managing the design of highway projects similar in scope and complexity.

Construction Manager

- Shall be responsible for ensuring that the project is constructed in accordance with the design and project requirements
- Shall be present at the site of work at all times construction is in progress
- Shall work under the direct supervision of the Design-Builder’s Project Manager.
- Fifteen (15) years of experience managing complex infrastructure projects

- Ten years (10) experience managing the construction of major urban freeway systems
- Five (5) years of major design-build construction management of major urban freeways
- Shall have recent experience managing the construction of highway projects similar in scope and complexity

Design Lead Engineer - Roadway (Engineer of Record)

- Shall be responsible for ensuring that the roadway design is completed and design criteria are met.. This person is the Engineer of Record for the roadway design
- Shall reports directly to DB Design Manager
- Must be present at all review and design coordination meetings
- Shall have a minimum of ten (10) years of recent experience as Engineer of Record and in roadway design on the California State Highway System
- Shall have a minimum of ten (10) years of recent experience in the design of roadways in major urban freeway systems similar in scope and complexity
- Shall have a license as Professional Engineer in California now or by the time the first Notice to Proceed is issued.

Project Scheduler

- a) Works directly for the Design-Builder
- b) Shall have fifteen (15) years experience in scheduling complex infrastructure projects
- c) Shall have five years (5) experience of schedule management on major urban freeways

Environmental Compliance Manager

- Shall report directly to the Design Manager.
- Shall attend regularly scheduled review, progress, coordination, and other meetings at the co-located facility.
- 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 responsibility for environmental compliance management including overseeing the implementation, day-to-day monitoring, and maintenance of all issues relevant to environmental compliance. This shall include issues related to Storm Water Quality and Best Management Practices.
- Shall have previous experience on more than one project, which required substantial coordination with Army Corps of Engineers, California State Regional Water Quality Control Board, California Department of Fish and Game (including preparation of permit applications), implementing measures addressing impacts to threatened and endangered species, implementing measures addressing impacts to waters, and implementing measures addressing cultural and paleontological resources (including on-site monitoring related to all of the above).
- Shall have experience on multiple projects requiring implementation of measures to address air quality, noise, and hazardous waste compliance requirements
- Shall have previous experience developing measures to satisfy Section 401, 404, and 1602 requirements as identified by corresponding Resource Agency, pertinent to issuance of same
- Shall act as the leader of the Environmental Team and shall not be assigned any other duties or responsibilities on the Project.
- Shall have recent experience managing and overseeing the environmental compliance of major highway projects.

Safety Manager

- Must not be under the direct supervision of construction personnel and will report directly to Design-Builder's Project Manager.
- Shall be on Site weekly and 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.
- Shall have ten (10) years experience managing complex infrastructure projects
- Shall have five (5) years of construction safety management experience in implementing and managing safety programs and maintaining compliance with safety regulations during construction activities on major urban freeways.
- Must be familiar with work zone safety regulations and must have recent experience working in roadway work zone safety and OSHA (Cal-OSHA) regulations.

Traffic 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, work zone safety, and work zone traffic control plan design.
- Shall have ten (10) years recent relevant experience in traffic engineering and traffic management on similar projects.

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 Deductions for Removal

Unless otherwise Approved, the Design-Builder will be assessed a monetary deduction for Key Personnel who cannot meet the following commitments to the Project, except due to retirement, death, disability, incapacity, or voluntary or involuntary termination of employment

The Design-Builder's Project Manager is to remain on the Project until Final Acceptance; if not, the monetary deduction to be assessed will be \$20,000.

The Design-Builder will be assessed a monetary deduction of \$15,000 for each of the Key Personnel in the following list who does not remain on the Project for the completion of his or her particular function:

- Project Manager
- Quality Manager
- Design Manager
- Construction Manager
- Design Lead Engineer - Roadway (Engineer Of Record)
- Project Scheduler
- Environmental Compliance Manager
- Safety Manager
- Traffic Engineering Manager

For any changes in personnel, the Design-Builder shall submit the qualification summaries and resume of the individual and obtain written Approval of the person's participation in the Project before his or her start of work.

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

For this Project, co-located facilities will not be required

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 is responsible for public safety and 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 to ensure, public, and worker safety.

The Safety Management 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

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- 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, 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, 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

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.

EXHIBITS

- Exhibit 2-A Quality Manual Template
- Exhibit 2-B Notice of Materials to Be Used Form (CEM-3101DB)
- Exhibit 2-C Inspection Request Form (TL-38DB)
- Exhibit 2-D, Source Inspection Material Control Process

These exhibits are provided as electronic files

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 guidelines and policies. These include meeting customer expectations with information that is reliable and encourages open communications with and among all audiences.

3.2.1 Standards

1. *Caltrans Project Communication Handbook*

3.2.2 Public Information Plan

At a minimum, the Department requires its communications efforts for this (and every) Project to 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 Department or delegated Design-Builder shall serve as a facilitator to address public information issues and shall be proactive in providing information and responding to the public. Approval of the PIP by the Department is required prior to implementing any work covered under the PIP.

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 mobile, office, fax and pager numbers, to the Department within two Days of NTP1. The Design-Builder’s public information staff shall hold coordination meetings with the Department at a frequency determined by the Department. The Design-Builder shall meet with the Department bi-weekly and as determined by 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 include 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 Records Act throughout the Project. The Design-Builder shall coordinate communications with the Department prior to dissemination.

3.2.3 Customer Groups (Audiences)

The Design-Builder, working directly with the Department, shall identify the initial complete set customer groups that shall be communicated with during the Project. The Design-Builder will be responsible for changes to the initial complete set of customer groups, but must receive approval from the Department before implementing changes. 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, e.g. FedEx Logistics Distribution Center
- Local government staff and regional government officials
- Native American Tribes coordinated with during the Project Approval and Environmental Document phase of the Project
- Directly affected Chambers of Commerce
- Advisory Committee
- State legislators
- Local and Regional transits/buses
- Department employees
- School district transportation agencies/charter companies
- Business owners, employees, and customers
- Neighborhood and business associations
- News media
- Emergency response agencies, including but not limited to police, fire, and ambulance agencies
- County Sheriff
- Utilities when necessary
- Local tourist destinations
- Local delivery and courier services
- School districts
- Local Colleges/Universities
- Water management organizations, environmental permitting agencies, and other local service districts
- United States Forest Service
- Railroads

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
- Media response protocol

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 concerns 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 concerns, 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.

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 and prior to dissemination.

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 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:

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- 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 posted on the Project's public Web site no later than one business day 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.

This information includes changes to short-term construction-related closures or emergency closures and changes, in scheduled construction activities. The Design-Builder shall 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. Upon the Department's approval of such changes, the Design-Builder shall post the information on the Web site, and disseminate it through other technologies.
- All information, unless otherwise stipulated in advance by the Department, shall be verified for accuracy and approved by the Department 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.

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

The Design-Builder shall include the following types of information and minimum performance requirements in the Public Information Plan.

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
- Detours (if applicable)
- Hours of work

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, businesses and identified customer groups (from Section 3.2.3) throughout the project life.

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

- Residents, businesses, and access to public areas of interest or scheduled activities affected
- Alternate routes and detours
- A contact for further information
- Time of day and duration of the impact

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

Twenty one Working 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 8 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
- Any additional information required by the respective agencies or units

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, the Department 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 emergency services.

3.2.5.1.6 Changes to Access

The Design-Builder shall inform businesses and residents of any changes to access at least 10 Working 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. 10 Working Days prior to start of construction, the Design-Builder shall submit to the Department information regarding changes in access.

3.2.5.1.7 Bicycle, Pedestrian, Handicapped Mobility, and Access

The Design-Builder shall clearly define and communicate to the Department accommodations for access by bicycles, pedestrians, and handicapped persons, equestrian including alternate routes and detours. The Design-Builder shall make every effort to accommodate and maintain accessibility throughout the duration of the Project.

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 and County of San Bernardino.

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 and around 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, parades, and sport events.) 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. Also, see section 18 Maintenance of Traffic for District 8 special events.

The following are some of the public and private entities that can provide current scheduled events.

- City of San Bernardino
- Wrightwood/Ski Resort
- County of San Bernardino
- Glen Helen Regional Park
- Las Vegas Convention and Visitors Authority

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 coordination 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 with authorization from the Department 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

When media relations efforts are required by the project, as determined by the Department, media relations will be managed by the Department's District 8 Public Affairs Coordinator. The Department may delegate media relations to the Design-Builder on a case-by-case basis. 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 direct media questions through the Department. 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 Department. The Design-Builder will take specific Project information (e.g., lane closures, ramp/loop closures, roadway closures) and provide it to the Department and traffic-information Web sites.

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, San Bernardino Associated Governments and the Design-Builder. Approval of all Project identity and brand materials will be a cooperative effort between the Design-Builder and the Department.

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 will be available from the Design-Builder and 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 IE511 Roadway Information System.

3.2.7.2.1 Web Site

With oversight by the Department, the Design-Builder shall create and maintain the Project's public Web site to provide Project information about construction, transit options, alternate routes, and other relevant information. The Design-Builder shall work with the Department to develop innovative and creative strategies to enhance the existing Web site and the 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 Department Project Web requirements.

The Project Web site shall adhere to State web accessibility requirements, including the W3C Web Accessibility Guidelines 1.0 Priority Levels 1 and 2, as well as Federal Rehabilitation Act Section 508 standards. Additional information can be found here:

http://webtools.ca.gov/Accessibility/State_Standards.asp

The Design-Builder shall maintain a project-specific Twitter handle for the project. All closures and public meeting notices shall be tweeted from the project-specific Twitter handle a minimum of 3 days prior to their occurrence.

The Design-Builder shall maintain a project-specific Facebook and Google+ presence. All closures and public meeting notices shall be posted to status updates on the project-specific Facebook and Google+ page.

3.2.7.2.2 Radio Advertising

For all major lane closures (closures exceeding 30 minutes delay), radio advertising spots shall be utilized to inform the public of the closure. The radio advertising spots shall be run at least one week prior to the start of the closure and continue throughout the closure. Radio advertising spots shall adhere to the following requirements:

- Be broadcast on a minimum of 4 stations with coverage in the Inland Empire. Radio stations shall be in the top 6 stations of preferred stations for households with one or more vehicles and employment or residence in San Bernardino County (per Arbitron ratings). The list of stations shall be approved by the Department prior to purchase of the spots.
- Be broadcast on a minimum of 2 stations with coverage in Las Vegas, Nevada. The list of stations shall be approved by the Department prior to purchase of the spots.

- A minimum of six radio spots per day, with two spots in the morning peak hour, two spots in the evening peak hour and two spots during the day between peak hours.
- Each spot must be a minimum of 30 seconds in length, with the script approved by the Department prior to running.

3.2.7.2.3 Newspaper Advertising

For all major lane closures (closures exceeding 30 minutes delay), newspaper advertising shall be utilized to inform the public of the closure. Advertisement shall be run every day starting at least 3 days prior to the start of the closure, and shall adhere to the following requirements:

- Be advertised in at least two newspapers with circulation in both San Bernardino and Riverside Counties, as well as the largest paper of record in Los Angeles County, Orange County, San Diego County, and Las Vegas.
- Advertisement shall be a minimum size of 1/8th of a page and be approved by the Department prior to purchase.

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 Contract Manager, Department public information staff, designated local agencies representatives 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. The list shall be updated as changes occur.

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 monthly construction meetings in a convenient location for community members in active Project areas when determined by the Department. Participants shall include the Design-Builder's Project Manager, Department Contract Manager, and a designated local agencies representative. At a minimum the locations of these meetings will include Inland Empire, High Desert, Wrightwood, and Phelan. Local participants shown above in Section 3.2.3 are invited to attend. The Department 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 local agencies representative at a mutually agreed upon location prior to the scheduled meeting

The Design-Builder shall conduct Open Houses in the Inland Empire, High Desert, Wrightwood, and Phelan within 14 Days of NTP1 to discuss construction staging, maintenance of traffic, and other issues of interest to the community.

3.2.7.4.2 Personal Contacts

A representative from the Design-Builder's public information team shall implement and manage door-to-door and phone contact with residents and businesses in areas of major activity, such as road and driveway

closures or construction operations at night. Contact shall occur at least 14 Days before work begins and shall consist of information explaining the planned work and the expected duration of the work, and providing contact information and answering questions. These contacts shall be conducted within a minimum four-block radius of the activity.

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. Any documents or accident report/information shall require approval by the Department prior to supplying the information to a third party.

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.

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 previously approved environmental documentation for Project.

4.2 Administrative Requirements

4.2.1 Standards

The Design-Builder shall perform the Work 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 specified herein or modified by Addendum or Change Order.

Environmental Standards and Requirements Priority Agency Title

Priority	Agency	Title
1	Department	Exhibit 4-A, Environmental Commitments Record
2	Department	Exhibit 4-B, Categorical Exemption/Categorical Exclusion Determination Form
3	Department	Standard Environmental Reference
4	Department	Special Provisions
5	Department	2010 Revised and New Standard Plans
6	Department	Standard Plans 2010
7	Department	Design Build Modifications to the Standard Specifications
8	Department	Standard Specifications
9	Department	Construction Site Best Management Practices (BMPs) Manual
10	Department	Storm Water Pollution Prevention Plan (SWPPP) and Water Pollution Control Program (WPCP) Preparation Manual
11	Various	Technical Memoranda
12	RWQCB	SUSMP Requirements
13	Department	Volume II, CT Environmental Handbook; Cultural Resources
14	Department	Volume III, CT Environmental Handbook; Biological Resources
15	Department	Volume IV, CT Environmental Handbook, Community Impact

4.2.2 References

Use the references listed below as supplementary guidelines for all environmental related analysis, design and construction. These references have no established order of precedence.

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
Department	Erosion Control Toolbox

4.2.3 Permits

All permits required for the Project will be the responsibility of the Design-Builder and permits provided by Department that must be amended or renewed as a result of the Design-Builder's Work or due to lapse in time shall be the responsibility of the Design-Builder. The Design-Builder shall provide the Department with copies of all permit applications, drawings, correspondence, and environmental management plans at least 3 days prior to the Design-Builder approval of permits submittal so that the Department may review, comment and approve.

The Design-Builder shall comply with the requirements of all permits.

Should the Design-Builder's design necessitate modification of permits obtained or require for permits to be obtained, it is the Design-Builder's responsibility to obtain all necessary agency approvals for permit modifications and new permits. Modifications of permits previously obtained shall be subject to approval by the Department prior to submission to the agency responsible for the permit approval.

4.2.4 Mitigation Measures

The Design Builder shall be responsible for the design, implementation, and maintenance of all mitigation measures during the life of the Project to minimize potential environmental impacts. Mitigation measures include, but are not limited to, those identified in the Preliminary Engineering Documents and these Technical Provisions, any additional measures resulting from permit requirements, and any other environmental commitments. The Design Builder shall ensure the Project design is in compliance with all applicable Governmental Rules and shall prepare plans and procedures to assure compliance, where required.

4.2.5 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, 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; 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:
 1. Design Builder-caused hazardous material spill
 2. Discharge to groundwater
 3. Discovery of:

- An active bird nest (with eggs or young)
- Cultural or historic artifacts
- Human bones or 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
- Violation of permits and regulations

4. Any pollution issue not covered in items listed above

The Environmental Notification Contact List shall be current at all times. Updated copies shall be submitted to the Department as required.

4.2.6 Environmental Management Plan

The Design-Builder shall submit an Environmental Management Plan (EMP) that describes the Design-Builder's approach, based on the Mitigation Monitoring and Reporting Record for mitigating environmental impacts and containing the following elements:

- Environmental personnel and training
- Environmental notification contact list
- Schedule of EMP activities
- Spill Containment and Countermeasure Plan to describe the Design-Builder's plans to prevent, contain, clean up, remove, dispose and mitigate all regulated material spills caused by the Design-Builder or any Design-Builder related entities. The Plan shall be in accordance with the July 2002 United States Environmental Protection Agency (EPA) update. The Spill Containment Plan shall include a Notification List for containing and reporting.
- Hazardous Materials Management Plan, including procedure for discovery of unanticipated hazardous waste or contaminated materials
- Construction Noise Monitoring Plan
- Air Quality Management Plan
- Asbestos Control Management Plan
- Lead-Based Paint Control Management Plan
- Aerially Deposited Lead (ADL) Soils Management Plan
- Storm Water Data Report (SWDR)
- Storm Water Pollution Prevention Plan (SWPPP)
- Sedimentation and Erosion Control Plan
- Noise Control Plan

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

4.2.6.1 Environmental Personnel and Training

4.2.6.1.1 Environmental Personnel

The Design-Builder shall designate an Environmental Team that consists of those persons responsible for permitting, erosion and sediment control, environmental compliance, environmental monitoring, and hazardous materials.

Permitting Specialist

The Design-Builder shall provide a Permitting Specialist to supervise the work necessary to acquire any permits required for the Project that were not included in the Contract Documents, including permits that must be modified as a result of the Design-Builder's Work. The Permitting Specialist 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 Permitting Specialist 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.

Storm Water Pollution Prevention Plan Manager

The Design-Builder shall provide a Water Pollution Control Manager (WPCM) and/or SWPPP Preparer that has the qualifications provided in the 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 NPDES permit.

Erosion and Sediment Control Specialist

The Design-Builder shall assign a California Licensed Landscape Architect with Certified Professional in Erosion and Sediment Control (CPESC) Certification 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 [project name] Storm Water Quality Master Plan.

The Certified Erosion Control Specialist 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 Specialist shall perform the required weekly erosion control inspection reports.

Erosion Control Installer

At least one California Licensed Landscape Contractor with a C-27 license specializing in erosion control application at the time of installation shall be required for the following erosion control activities: seeding, planting, mulching, silt fence or other perimeter sediment control device installations, erosion control blanket installation, hydraulic soil stabilizer installation, check dam installation, storm drain inlet protection, riprap placement, compost installation, and rolled erosion control product installation.

4.2.6.1.2 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:

- The overall importance of environmental issues in achieving a successful project
- The particular environmental sensitivities of the Project
- Erosion and sediment control procedures in accordance with the SWPPP including the functions and proper installation of Best Management Practices (BMPs) to be implemented on the project.
- Proper procedures for spill containment
- Proper and safe handling of contaminated soil and groundwater

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.

4.2.7 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 are to be certified for the materials they are testing.

4.2.8 Coordination with Other Agencies and Disciplines

The Department will assist in the coordination and resolution of all environmental 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.

4.2.9 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 Environmental compliance 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 a record of the minutes to the meeting within five (5) days.

4.2.10 Environmental Reevaluation

The Design Builder shall make every effort to keep the project within the boundaries identified when the project Environmental Document was completed. Should the scope of extent of the project be altered during the project design or construction phase, those changes that extend the project beyond the limits of construction shall be reviewed by the Department's Environmental staff members to determine the need to obtain an environmental reevaluation.

4.3 Design Requirements

The Design-Builder shall design and construct all elements of the project related to Environmental Compliance in accordance with all the standards and regulations listed in this Technical Provision. The Design-Builder will be responsible for complying to all the requirements listed in the Environmental Commitments Record (Exhibit 4-A). The Design-Builder shall incorporate into the proposed improvements all the requirements listed in Exhibit 4-A

4.4 Construction Requirements

4.4.1 Mitigation Measures

Mitigation measures cover all areas of environmental concern impacted by the Project, with a detailed list of actions required and assignment of responsibility for each action. The list shall include environmental requirements, including watershed and local government consent conditions, and include recognition of

Project specific issues, procedural steps for mitigation and particular actions planned to comply with the governing regulations. The Design-Builder shall be responsible for maintaining mitigation measures during the life of the Project to minimize potential environmental impacts. Design-Builder shall ensure the Project design is in compliance with all applicable Governmental Rules and shall prepare plans and procedures to assure and document compliance, where required.

All measures indicated in environmental compliance documents must be adhered to.

4.4.1.1 Cultural Resources

The Design-Builder shall make every effort to keep the project within the boundaries identified in the project Environmental Document. Should the scope of extent of the project be altered during the project design or construction phase, those changes that extend the project beyond the limits identified on the Area of Potential Effect (APE) (Exhibit 4-C), limits shown on the typical cross-sections shall be reviewed by the Department Cultural Resources staff members to determine the need to obtain an environmental reevaluation.

4.4.1.2. Contaminated Materials

Asbestos Containing Material (ACM) and Regulated Waste

All Asbestos-related work shall be performed by a properly licensed Asbestos Abatement contractor or subcontractor, certified by the Contractors State License Board (CSLB) and registered with the Department of Industrial Relations, Division of Occupational Safety and Health Cal/OSHA. Lead abatement work, if required, shall only be performed by a person certified by the Department of Health Services. All work shall be done in accordance with all city and/or county codes and regulations and Air Quality Management District (AQMD) regulations.

Upon discovery, the Design-Builder shall immediately stop working in and notify the Department in compliance with Section 14-11.02A, “*Unanticipated Discovery of Asbestos and Hazardous Substances*” of the Standard Specifications

The Design-Builder shall abate all hazardous materials to include but not limited to friable and non-friable asbestos and lead paint, according to all environmental laws and regulations, and provide any necessary Storm Water Pollution Prevention Plan (SWPPP) or Water Pollution Control Program (WPCP) and implementation of such Plan(s).

Prior to starting demolition operations, the Design-Builder shall be responsible to ensure utility companies have disconnected and removed meters, service lines, LP tank or natural gas tank.

The Design-Builder shall procure all necessary permits and pay all fees related to ACM and Regulated Waste.

NESHAP Asbestos Notification shall be required if structures will be disturbed during construction. The appropriate special provisions for testing of areas suspected to contain ACM and for handling and disposal of ACM shall be provided for review and approval. The Design-Builder shall prepare an Asbestos and Regulated Materials Assessment Report that describes the results of the assessment and of the abatement and removal activities.

In the event that additional waste materials suspected of containing asbestos or other regulated materials are encountered during construction activities, the Design-Builder shall immediately stop work and provide notification. The Design-Builder will perform all work necessary to assess, abate, and remove any asbestos or other regulated materials.

Health and Safety Plan

Hazardous Materials may exist on the surface, subsurface, groundwater, or on structures to be demolished, and may be mixed with soil, water, and/or other waste materials.

The Design-Builder shall prepare a Hazardous Waste Operations Safety and Health Program for Hazardous Waste Operations, following Federal, State of California and local requirements including CAL/OSHA, CCR Title 8, 5192 et seq., and Federal OSHA, 29 CFR 1910 et seq, and 1926 et seq. A Certified Industrial Hygienist licensed by American Board of Industrial Hygiene shall approve the Hazardous Waste Operations Safety and Health Program.

The Design-Builder shall submit a site specific Health and Safety Plan (HASP) as Part of the Hazardous Waste Operations Safety and Health Program, and as defined in CCR Title 8, 5192(1)(B), within thirty (30) days of receiving Notice to Proceed.

The Design-Builder shall distribute the HASP to all employees that could be potentially exposed to Hazardous Materials. Employees shall be required to read the HASP, sign a compliance agreement, and abide by all provisions. The HASP shall be displayed or made available on the Project at all times. The Design-Builder shall develop and maintain on site all industrial hygiene information, including “right-to-know” information. It is anticipated and considered as part of the Scope of Work that the Design-Builder will perform Hazardous Waste Operations requiring protective gear up to and including Level C. The Design-Builder shall provide Personal Protective Equipment (PPE) and monitoring equipment to conform to the requirements set forth by CAL/OSHA and Federal/OSHA.

In the event that the Design-Builder encounters or has reason to believe it has encountered Hazardous Materials requiring Hazardous Waste Operations on the Project, the Design-Builder shall provide verbal notification and proceed with the Hazardous Waste Operations work.

The Design-Builder shall then provide written notification by implementing a mitigation plan. If the finding of Hazardous Substances precludes the continuation of work in that work area, the Design-Builder shall continue Working in areas not affected thereby.

The Design-Builder shall maintain documentation and provide information, as requested, regarding potential or actual exposure to the public.

The Design-Builder shall maintain records of all related incidents and provide notification immediately.

The Design-Builder shall be responsible for management of the Hazardous Materials and Hazardous Waste encountered on the Project.

Removal, Handling, and Transportation of Hazardous Materials

The Design-Builder shall be responsible for the removal, handling, transportation and disposal, if any, of Hazardous Materials, including but not limited to asbestos, yellow striping, lead paint, and ADL contaminated soil resulting from the Project. Design-Builder shall be responsible for filing any information regarding the discovery, handling, removal, transportation and disposal of Hazardous Materials related to this Project with the appropriate Federal, State or local regulatory agencies. Such information includes investigation reports, health and safety plans, transportation and waste tracking documentation, field-testing results and reports, NPDES Permit and DTSC variance records and correspondence, regulatory notifications, and any hazardous waste or contaminated material correspondence. All draft documents for the regulatory agencies are to be provided for review and concurrence.

The Design-Builder shall be responsible for obtaining the Environmental Protection Agency Identification (EPA ID) number from DTSC no later than seven (7) calendar days in advance of the excavation and or removal of any Hazardous Material, Hazardous Waste, or contaminated material. The following information shall be required:

- Type of material (physical characteristics)
- Volume (cubic yards or gallons)
- Site address (at a minimum, route, post miles, and cross streets)
- Zip Code (mandatory for tracking purposes)

- Test results or waste profile

Once an EPA ID number has been obtained, the material shall be manifested by a transporter that possesses the credentials required under Title 22 (§66263) of the CCR. Design-Builder shall submit copies of the manifests signed by the disposal facility.

Bills of lading are needed for tracking and transporting ADL-affected soils to reuse sites. Copies of the bills of lading are to be attached to As-Builts prepared for the Project. After notification in writing, the qualification of ADL material for reuse will be verified.

The Design-Builder shall have means for conducting emergency Hazardous Materials Management (i.e., tank removal, lead abatement, asbestos abatement, spills, etc.). The Design-Builder shall immediately notify the Department of such conditions.

Removal and Disposal of Yellow Thermoplastic and Paint

Yellow striping removal poses a hazardous waste concern whether the striping is ground off alone or ground off with pavement. The Design-Builder shall provide a Lead Compliance Plan (LCP) and shall be submitted for comments and approval at least two (2) weeks before fieldwork begins. Testing on removed material must be conducted for classification purposes. The Design-Builder shall remove and dispose of yellow striping per *Caltrans Special Provisions*.

Soil and Groundwater - General

The Design-Builder shall review all Phase I and Phase II Environmental Site Assessment (ESA) reports completed for the Project. The Design-Builder shall be responsible for updating the Phase I ESA if the Department or the Design-Builder determines the Phase I ESA is inadequate in its coverage of the Project area. The Design-Builder shall be responsible for additional drilling investigation and/or Phase II work that may be needed to accommodate the work.

The Design-Builder shall sample and test the soils and groundwater that are suspected to be contaminated. The Design-Builder shall also monitor soil excavation activities and evaluate planned treatment procedures. When all contaminated soil excavation and corrective action, and all groundwater dewatering has been completed for the Project, the Design-Builder shall prepare a Corrective Action Implementation Report for the entire Project. The report shall be completed in accordance with applicable California Pollution Control Program requirements. The Design-Builder shall install wheel/undercarriage washing equipment, or a functional equivalent, at excavation locations, as the first method by which to ensure that haul trucks have clean wheels and undercarriages before entering the roadway.

Contaminated Soil Contingency Plan

In the event on-site observations indicate contaminated materials (such as solid waste including demolition debris, containers or free product) or contaminated soil (based on organic vapor detector readings above background, visual staining or olfactory evidence) have been encountered in the Project area, the Design-Builder shall be responsible for notifying and for filing any information with the appropriate Federal, State or local regulatory agencies.

No excavation of contaminated materials or soil shall take place without Approval.

The Design-Builder shall stockpile all contaminated material or soil encountered within excavation limits as described in these provisions. To expedite the bridge substructure construction, the Design-Builder may haul and temporarily stockpile all excavation materials from the bridge substructure construction to the temporary stockpiles sites designated near the Project site as approved by the Department.

The Design-Builder's disposal plan for contaminated soil may include re-using the contaminated soil in fill areas on this Project. The Design-Builder shall locate the contaminated soil on the As-Built Plans.

The Design-Builder may determine that some or all of the contaminated soil and all of the contaminated materials must be disposed at a California-permitted municipal solid waste (MSW) landfill facility or

industrial landfill facility. The Design-Builder shall select the California permitted MSW landfill facility or industrial landfill facility for disposal of the contaminated soils and materials.

The Design-Builder shall be responsible for providing all required information to the landfill (typically waste profile information and soil analytical data) in order to obtain landfill acceptance of the contaminated soil for disposal or for use as daily cover as dictated by landfill acceptance criteria.

The Design-Builder shall provide access to in-place and/or stockpiled soil to collect and analyze any additional samples required by the landfill.

The Design-Builder shall provide the landfill-required waste profile form(s) for review and signature.

Contaminated material shall not be hauled to the landfill facility until the Design-Builder has written approval from the landfill accepting the contaminated material for disposal at the landfill facility.

The Design-Builder shall provide copies of shipping papers/manifests and landfill scale tickets daily while material is being hauled to the landfill.

Temporary Stockpile of Contaminated Soil

The stockpile shall be placed at a location near the Project as approved by the Department. The Design-Builder shall stockpile the contaminated soil on minimum 10-mil plastic, and cover the stockpile with minimum 10-mil reinforced plastic. Fencing shall surround the stockpile. The stockpile cover shall be securely anchored. The Design-Builder shall be responsible for the maintenance of the stockpile cover for the duration of the Contract or until all contaminated material is removed. The Design-Builder shall inspect the stockpile a minimum of once per week. The Design-Builder shall keep records of the weekly stockpile inspection, recording at minimum, the date and time inspected, and the stockpile coverage pre and post-inspection. Contaminated soil from different locations that may contain different contaminants shall be placed and maintained in separate stockpiles.

Contaminated Groundwater Contingency Plan

It is not known if any groundwater within the Project limits is contaminated. Because of the potential for contaminated properties with known or potential PAH, volatile organic compound (VOC), and petroleum-impacted groundwater located in the Project area, all groundwater dewatering necessary to complete the Project must be done under the assumption that the dewatered groundwater is contaminated. The Design-Builder shall provide notification no less than five (5) days prior to beginning any Project dewatering. The Design-Builder shall account for the treatment of contaminated groundwater in the Design-Builder's Project schedule where construction work will disturb these areas. The Design-Builder shall minimize Project dewatering to the greatest extent possible.

The Design-Builder shall obtain a groundwater discharge National Pollutant Discharge Elimination System (NPDES) Water Quality Permit to treat contaminated groundwater and to discharge treated groundwater to the storm sewer and all other necessary permits and approvals for dewatering. A groundwater discharge NPDES permit could replace the dewatering permit.

For all Project dewatering, the Design-Builder shall ensure that groundwater discharged to the storm sewer shall outlet at no more than two final discharge points. A final discharge point is the point at which the dewatered groundwater leaves a man-made pipe conveyance system and enters the environment in a ditch, pond, or river or other water body. Samples of dewatered groundwater will be periodically collected and analyzed at the final discharge points until all dewatering for the Project is completed. The Design-Builder shall provide notification no less than five (5) days prior to placing an active discharge point on or off-line to collect samples, if necessary. The Design-Builder shall provide access to all active discharge points.

The Design-Builder shall measure the rate of groundwater discharge during dewatering. The Design-Builder shall record the rate of discharge daily, and shall submit a discharge report weekly.

In the event groundwater cannot be directly discharged into the storm or sanitary sewer because of excess contaminant concentrations or because it contains free (undissolved) petroleum products, the groundwater shall be treated prior to discharge. The Design-Builder shall supply a portable groundwater treatment system that includes but is not limited to the following components: flow equalizer, oil/water separator, suspended solids removal (filtration through a bag filter), granular activated carbon filtration, and/or aeration. The portable groundwater treatment system shall have a treatment capacity equal to or greater than the rate of temporary construction dewatering. The portable groundwater treatment system shall be Approved prior to mobilization of any groundwater treatment system components to the Project site.

Aerially Deposited Lead

Aerially deposited lead is lead deposited within unpaved areas or formerly unpaved areas, primarily due to vehicle emissions. ADL is typically found within the top five (5) feet of material in unpaved areas within the highway ROW. ADL is may be present within the planned ROW limits.

All areas were not sampled for ADL due to various constraints. The Design-Builder shall sample the project areas to prepare the classification of the soil for the entire stretch of the project with respect to ADL. To verify the preliminary classification of soil, the soil may either be sampled in situ (before excavation) or sampled from stockpiles after excavation. The Design-Builder shall use a laboratory certified by the California Department of Health Services for testing of samples. Sampling, analysis and reporting of test results shall be performed according to USEPA, SW-846 “Test Methods for Evaluating Solid Waste,” Volume II; Field Manual Physical/Chemical, Chapter Nine, Section 9.1.

GIS Data Collection

The locations of samples/borings shall be recorded in the field, using the Department’s GPS NAD83 datum. The Design-Builder shall be provided with an electronic Microsoft Access 2000 Database file to record investigative data for each boring, sample, and test performed. GPS data shall be recorded in accordance with the allowable format and tolerances required in the *Caltrans Surveys Manual*. All borings shall be identified by a pre-assigned unique identification number system as described below.

Borehole Naming Convention

For Borehole naming convention, the Design-Builder shall use a 3-digit unique ID assigned by Department followed by a dash and sequential boring numbers beginning with “101C”. (Example: for this project where the assigned Unique ID is 964, the borehole names would be 964-101C, 964-102C, 964-103C, etc.)

Sample Naming Convention.

For sample naming convention, the Design-Builder shall label the sample with the name of the borehole from which it was derived, followed by a dash and the depth of the sample in meters. For this project, samples taken from borehole 964-101C at the surface, 0.60 meters and 0.90 meters would be named 964-101C-0, 964-101C-0.60 and 964-101C-0.90, respectively.

The sample data and analytical results shall be recorded in the appropriate tables. Note that the database tables are related such that the borehole data record must be created first, followed by sample data records, and finally the analytical result records. The Design-Builder shall collect GPS data at the completion of each boring sample.

The Design-Builder shall submit a final electronic file of the GIS database in conjunction with the submittal of an electronic file of the final sampling results.

If sampled in situ, the Design-Builder shall follow the same protocol used in the Lead SI cited above. The sample depths shall be defined as follows:

- The surface sample is taken between 0 and 6 inches;
- The one-foot sample is taken between 1 and 1.5 feet;

- The two-foot sample is taken between 2 and 2.5 feet;
- The three-foot sample is taken between 3 and 3.5 feet, and
- The five-foot sample is taken between 4.5 and 5 feet.

Grading samples only need to be taken in the surface, one-foot and two-foot layers. Widening and footing samples need to be taken in the surface, one-foot, two-foot, three-foot and five-foot layers.

The Design-Builder shall submit for review and approval, a work plan at least three (3) weeks prior to sampling and testing areas for ADL, pH and Title 22 metals. All samples shall be tested for total lead, Total Threshold Limit Concentration (TTLC). All samples with TTLC exceeding 50 mg/kg shall be tested for soluble lead, Soluble Threshold Limit Concentration (STLC), using the California Waste Extraction Test (WET) by EPA Method 3050A (Citrate Acid). The Design-Builder shall test 50 % of the samples using STLC. Any STLC results equal to or greater than 5 mg/L shall be tested using the De-Ionized Water (DI-WET) method. Any TTLC results exceeding 1,000 mg/kg shall be tested using the Toxicity Characteristic leaching Procedure (TCLP) with extraction by EPA Method 1311. A total of 30% of all soil samples with the highest TTLC values shall be tested using the TCLP method. 10% of all samples shall be tested for pH. 5% of all soil samples with highest TTLC values shall be tested for Title 22 metals.

The Design-Builder shall comply with the Department of Toxic Substances Control's Variance in handling ADL material and recognizing the purpose of 'SB14 Hazardous Waste Source Reduction', the Design-Builder shall reuse all the ADL contaminated soils that meet the Variance criteria. The Design-Builder shall survey the locations where ADL soil is reused according to the DTSC Variance. These locations shall be shown on the as-built plans and the coordinates shall be provided. During construction of previous projects within the project limits ADL contaminated soils were reused per the DTSC Variance.

The Design-Builder shall prepare special provisions identifying the limits, extent of ADL, and handling of ADL in accordance with the Variance for each design submittal. The Design-Builder shall prepare an LCP and an Evacuation and Transportation Plan (ETP). The LCP and ETP shall be submitted for review and approval 2 weeks prior to excavation activities.

The LCP shall prevent or minimize worker exposure to lead while handling material containing ADL. It shall include perimeter air monitoring incorporating upwind and downwind locations. Daily monitoring shall take place, under the direction of a Certified Industrial Hygienist, while the Design-Builder clears, grubs and performs earthwork operations.

The ETP shall include an excavation schedule, temporary locations of stockpiled material, appropriate plastic sheeting to cover the stockpiles, locations of samples and laboratory results, dust control measures, the proposed site for disposal of the hazardous waste and a spill contingency plan for ADL soil.

Unless all soil is tested in situ, grab samples shall be taken from stockpiled soil. The Design-Builder shall comply with DTSC Variance for reuse of stockpiled soil. At least one sample shall be taken for each 200 cubic yards of stockpiled soil and tested for lead using EPA Method 6010 or 7000 series.

Excavation, transportation, reuse and disposal of material containing ADL shall be in conformance with all environmental laws.

The Design-Builder shall perform and submit a statistical analysis of laboratory results in accordance with the SW-846 and as specified in the DTSC Variance. The Design-Builder shall determine:

- If the soil is defined as a hazardous waste per CCR Title 22 due to the total lead concentration greater than 1,000 mg/kg and/or soluble lead concentration greater than 5.0 mg/L or,
- If the Variance issued by DTSC to reuse soil containing lead on-site is applicable, and under what conditions the lead contaminated soil can be reused

The Design-Builder shall note that No statistical analysis shall be performed if none of the samples contained hazardous levels of lead.

4.4.1.3 Noise

Construction Noise

The Design-Builder shall submit a Noise Control Plan and a Noise Monitoring Plan.

The Design-Builder shall not operate noise generating construction equipment at the construction site prior to acceptance of the Noise Control and Monitoring Plans. The Design-Builder shall update the Noise Control Plan every twelvemonths.

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.
 - 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 fit all internal combustion motors with mufflers and other noise control equipment as specified by the manufacturer.
 - The Design-Builder shall outfit construction equipment engines with adequate mufflers, intake silencers, and engine enclosures to reduce their noise levels by 5 to 10 dBA.
 - 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 use ambient sound-sensing backup alarms that could reduce disturbances from backup alarms during quieter construction periods.
 - 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 the Department, 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 mitigate construction/grading activities that disrupt ground cover by controlling fugitive dust emissions and other airborne particulates in accordance with these provisions, including measures such as applying water to exposed soils and limiting the extent and duration of exposed soil conditions. The Design-Builder shall prepare and implement a Generated Waste Management Plan, and a Storm Water Pollution Prevention Plan (SWPPP). The Generated Waste Management Plan shall be prepared and implemented in accordance with Title 22, Division 4.5, California Code of Regulations (CCR), and all other applicable laws and regulations.

- The Design-Builder shall designate an Air Pollution Control representative, knowledgeable in environmental matters. The representative shall be responsible for ensuring compliance with the Fugitive Dust Emissions Control Plan, its preparation, submittal, implementation, monitoring, and record keeping.
- The Design-Builder shall not cause or allow emissions of fugitive dust from any transport, handling, construction or storage activity to remain visible in atmosphere beyond property line of the emission source.
- The Design-Builder shall take precautions to minimize fugitive dust emissions from operations involving demolition, excavation, grading, clearing of land, and disposal of solid waste. Utilize at least one Temporary Best Management Practices (BMPs) for each source of fugitive dust.
- The Design-Builder shall prevent or immediately remove the track-out of bulk material onto public paved roadways as a result of Design-Builder's operations. and prevent the track-out of bulk material onto public paved roadways, and remove such material at any time track-out extends for more than 25 feet onto any paved public road, and remove all visible roadway dust tracked-out upon public paved roadways at the end of each Work day when active operations cease.

As a minimum, the Design-Builder shall use the following procedures and techniques:

- Trucks transporting soil, sand, other excavated, or backfill materials to or from the sites shall be covered with a tarpaulin from the point of origin to the point of unloading. The Design-Builder shall install wheel/undercarriage washing equipment, or a functional equivalent, at excavation locations, as the first method by which to ensure that haul trucks have clean wheels and undercarriages before entering the roadway.
- Daily or more frequently, if necessary, water down and sweep streets around and near to the site that have heavy volumes of construction vehicles carrying debris and excavated materials, and adjacent sidewalks.
- Establish regular cycles and locations for cleaning trucks that haul soil from site.
- If conveyors are used, cover all transfer points along conveyor system moving soil. Minimize drop height to the stockpile. Provide a sprinkler system that will apply water to soil before it drops to stockpile.

Burning of wastes is prohibited. The Design-Builder shall remove scrap and waste material and dispose of 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 such design and equipment and make available for inspection.

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.

During excavation, gases may be released from soil and from underground reservoirs. Gases may contain methane, other more complex hydrocarbons or hydrogen sulfide and may present hazards due to flammability or toxicity. Safety during construction is covered by regulations of OSHA and CAL/OSHA. Although composition, quantity and concentration of gases that might be released are unknown, release of gases into atmosphere may be subject to control by California Air Resources Board (ARB).

The Design-Builder shall, at all times, be responsible for responding to the air quality concerns and policies of USEPA, FHWA, local governments, and roadside neighbors throughout the design and building of the Project.

In the event that the scope or design of the Project is altered during the design-build process, the Design-Builder shall evaluate the necessity for further air quality analysis.

4.4.1.5 Water Quality

The Design-Builder shall comply with all regulatory requirements related to Water Quality as stated in the Environmental Document, including implementation of all related measures in the ECR for the Project.

The Design-Builder shall abide by all applicable provisions and requirements of the Construction General Permit (Order No. 2009-0009-DWQ, NPDES No. CAS000002) through the life of the project.

The Design-Builder shall coordinate with the Department's District NPDES Coordinator regarding SWMP requirements. The District NPDES Coordinator shall consult with the Regional Board (RB) only when the Department requirements are not met due to constraints within the project limits. In all such circumstances, the Design-Builder will provide the District NPDES Coordinator all information necessary so that the NPDES Coordinator can fully address the RB to their satisfaction regarding Treatment BMPs having been implemented to MEP. It is anticipated that the Design-Builder will generate two water streams: storm water and construction wastewater (resulting from truck wash-downs, construction activities, etc.). Design-Builder has the option of adopting a zero-discharge option (meaning all water will be collected and hauled off-site), discharging only storm water, or discharging both waste streams in accordance with applicable permits. The following are the requirements:

If the Design-Builder decides to use the zero-discharge option, the Design-Builder shall not discharge any wastewater on site. All wastewaters must be hauled offsite for disposal. None of the remaining requirements of Subsection 3.2 apply if this option is chosen.

The NOI requires the Design-Builder to prepare a Storm Water Pollution Prevention Plan and submit it to the State Water Resources Control Board, and submit a Notice of Termination (NOT) when construction is complete.

For all wastewaters, , the Design-Builder shall provide notification of its intent immediately. Design-Builder may discharge truck wash-down and other construction generated wastewater (in addition to storm water) if Design-Builder complies with the following requirements:

- Discharges to the sanitary sewer will require a Discharge Permit from the [local agency]. The Design-Builder must obtain and comply with all terms and conditions of the permit, including discharge limitations. The sewer permit may contain a total discharge limitation between [100,000 and 150,000 gallons per day], and may contain hour restrictions for water discharges.
- No discharges other than storm water may be discharged into the storm drain, unless Design-Builder obtains an applicable NPDES permit from the Santa Ana Regional Water Quality Control Board. Design-Builder is responsible for obtaining NPDES permits. If used, Design-Builder must comply with all terms and conditions of their NPDES permit. Discharges to the storm drain must be in compliance with the NPDES permit.
- Submit, 30 Days after NTP1, a fully detailed Water Quality Management Plan for Project discharges for approval.
- Prepare and submit a Storm Water Pollution Prevention Plan in accordance with the Clean Water Act, NPDES General Permit for construction discharges, and related federal and state laws and regulations. SWPPP shall be submitted within 30 Days of NTP 1.
- As required, prepare a Water Quality Management Plan (WQMP) and must be filed with the City or County of San Bernardino, whichever is applicable.
- All connections and transport of wastewaters shall be by closed conduit. If necessary install and maintain pumps to deliver wastewaters to their destination(s) described herein.

- Design-Builder Testing Requirements – At the frequency required by permit, sample and test effluent quality for those parameters of the Design-Builder’s responsibility. Record daily discharged quantities. Submit certified monthly reports not later than seven (7) Days after the end of the month detailing the daily flows and the testing data.
- Design-Builder Noncompliance – the Design-Builder shall bear any fines incurred as a direct result of the Design-Builder’s failure to treat those, herein, parameters that the Design-Builder is responsible for.
- Comply with storage and containment requirements of these materials in accordance with Federal, State or local Storm Water Permit Regulations.

4.4.1.6 [NOT USED]

4.4.1.7 Wildlife and Vegetation

The Design-Builder shall identify impacts, develop mitigation measures, and implement mitigation measures to minimize unavoidable construction and long-term impacts of the Project on wildlife and vegetation. Wildlife and vegetation mitigation measures shall include demarcation of sensitive wildlife and vegetation areas, protection of active bird nests, and control of invasive plant species. The Design-Builder shall provide notification if either of the following occurs:

- 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.

- Between February 1 and September 1, the Design-Builder shall provide notification 15 days prior to beginning work disturbing structures, the ground or vegetation to perform surveys. Approval will be given to the beginning of work disturbing the ground or vegetation between February 15 and September 1.
- The Design-Builder shall provide a Biologist to conduct the migratory bird nest survey within the Project limits prior to construction. The Biologist shall possess a degree in biological natural sciences from an accredited college or university and have 1 year experience in performing bird nesting surveys or as approved by the Department.
- 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. Minimizing slope length and ratio, preservation of existing vegetation 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 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 check dams, 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 Technical Provisions (Landscape) for erosion control.

4.4.2 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, 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, 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
 - 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 streams or wetlands
 - Outside the planned Right of Way limits
- Violation of permits
 - 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.

4.4.3 Schedule

The Design-Builder shall include with the EMP a schedule of activities for environmental mitigation 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 prior to construction. Response to the EMP submittal will be given within 15 Days.

4.5.2 Environmental Documents

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.

Asbestos and Regulated Waste

- Asbestos and Regulated Materials Assessment Report – Shall be submitted for approval.
- Asbestos and Regulated Materials Abatement and Removal Report – Draft shall be submitted for Approval. The final report of the results of abatement and removal activities shall be submitted no later than 30 Days after all abatement/removal actions are complete.

Contaminated Materials

If contaminated materials are discovered during site investigation the following Plans will be submitted as necessary.

- Investigation Work Plan – Shall be submitted for approval.
- Contaminated Soil Cleanup Plan – Shall be submitted for approval.
- Contaminated Soil Documentation Report – Shall be submitted for acceptance.
- Non-petroleum Contaminated Soil Voluntary Investigation and Cleanup (VIC) applications – Shall be submitted for approval and signature.
- Non-Petroleum Contaminated Soil Response Action Plan – The draft Response Action Plan(s) shall be submitted for Approval. The Design-Builder shall submit a draft Response Action Implementation Report for Approval no later than 40 Days after the cleanup actions are completed at each VIC site. If requested, the Design-Builder shall meet with to review the draft and final Response Action Implementation Report(s). After receiving the Department approval of the final Response Action Implementation Report(s), the Design-Builder shall submit the Response Action Implementation Report(s) to the MPCA VIC program for approval.
- Health and Safety Plan - Shall be submitted for approval.
- Lead Compliance Plan - Shall be submitted for approval.
- Evacuation and Transportation Plan - Shall be submitted for approval.

Groundwater

- Groundwater Discharge Report – Shall be submitted weekly.

- Contaminated Groundwater Dewatering Plan – Shall be submitted for approval.
- Contaminated Groundwater Documentation Report – Shall be submitted for acceptance no later than 60 Days after all contaminated groundwater-dewatering actions are complete.
- Wastewater Management Plan – Shall be submitted for approval.
- Correspondence file
- All final reports for environmental work

4.5.3 [NOT USED]

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
- Copies of applications for environmental approvals other than the provided approvals for review and to approval agency(s).
- Copies of all environmental submittals, correspondence, and secured environmental approvals.
- Noise reduction plan that outlines compliance with standards and local noise ordinances.
- Plan to communicate how advance notification of nighttime construction activities will occur.
- Copies of well abandonment forms submitted for each of the wells that are abandoned as a result of the Project.
- Hazardous Waste Contingency Plan.
- All final reports for environmental work.

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.

4.5.6 Measurement and Payment

All items for work to comply with environmental requirements not specifically identified for payment, will be paid for as a lump sum for Environmental work, as part of the Contract Price.

EXHIBITS

- Exhibit 4-A Project Environmental Document
- Exhibit 4-B Categorical Exemption/Categorical Exclusion Determination Form
- Exhibit 4-C Area of Potential Effect Map

These exhibits are provided as electronic files.

5 [NOT USED]

6 UTILITIES

6.1 General

The Design-Builder shall perform all Utility Work in accordance with the Contract Documents and these Project requirements. This section applies to existing and proposed underground and overhead Utilities. Responsibilities include, research existing utility information, identify utility conflicts, review relocation plans, approve relocation plans, and coordinate/monitor the physical utility relocation. The Design-Builder may be required to perform utility relocation design work or/and physical relocation under a separate Work Order. All work associated with temporary Relocations of Public and Private Utilities impacted by the Project and the Design-Builder's operations are the responsibility of the Design-Builder.

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 the Design-Builder shall accept the liability of any additional costs.

The Design-Builder will prepare all supporting documentation for the Notice to Owners (NTO) and Utility Agreements (UA) as required. The Department will issue NTOs and execute UAs with Utility Owners for Utilities in conflict.

6.1.1 Utility Involvement

The 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.

6.1.2 Public Utility Owners

The following Public Utility Owners may have facilities within vicinity of the Project:

- Devore Water Company (DWC),
- San Bernardino Municipal Water Department (SBMW),
- County of San Bernardino.
- City of Hesperia Water

6.1.3 Private Utility Owners

The following Private Utility Owners may have facilities within the vicinity of the Project:

- Time Warner Telecom (TWT),
- Sprint (S),
- Level 3 (L3),
- Verizon (V),
- Verizon Business (MCI),
- American Telephone and Telegraph (ATT),
- Williams Telecommunication (WT),
- Charter Communications (CC),
- Kinder Morgan (KM),
- Southern California Gas (SCG),
- Southern California Edison (SCE).
- Southwest Gas Corporation

6.2 Administrative Requirements

6.2.1 Standards

The Design Builder shall perform the Work 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 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 contract change order.

Priority	Agency	Title
1	Department	Policy on High and Low Risk Underground Facilities Within Highway Rights of Way
2	Department	Encroachment Permit Manual
3	Department	R/W Manual
4	Department	Design Information Bulletins
5	Department	Standard Special Provisions
6	Department	Standard Specifications, May 2006
7	Department	Standard Plans, May 2006
8	Department	Highway Design Manual
9	California	California Streets and Highways Code
10	AASHTO	A Policy on the Accommodation of Utilities within Freeway Right-of-Way
11	AASHTO	A Guide for Accommodation Utilities within Highway Right-of-Way
12	Department	Project Development Procedures Manual
13	Department	Plans Preparation Manual
14	Department	CADD Users Manual

6.2.2 Responsibility

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 limits of the Project, including all potentially impacted service lines and service laterals. The Design-Builder shall provide to the Department the Verification Maps with all known utility information plotted.

The Design-Builder shall be responsible for coordinating with utility owners to obtain Utility Verification information for the entire project limits .

The 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).

The Design-Builder shall provide the Department with Utility Conflict Maps for each Utility facility in conflict according to the Department's Design and Encroachment Policy (Section 600 of Encroachment Manual).

For those conflicts that cannot be protected in place, the Department will contact the owners of the Public Utility facilities and request the required Utility Relocation Plan. In the event that the owner cannot perform the design of the Utility Relocation Plan, the Department may request the Design-Builder to perform this activity under a specific Work Order.

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

If the Utility 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 Utility Relocation Plan is not approved by the Design-Builder, the Design-Builder shall provide detailed reason, and 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.

The Design-Builder shall cooperate with the Utilities Owners, the Department, and other involved parties in the submittal processing and execution of all utilities related Work Orders. The Design-Builder shall provide all information required for Work Orders, including plans, estimates, and specifications within 5 working days upon the Department's request.

A copy of the Notice to Owner will be forwarded to the Design-Builder. Whether the Utility Owner or the Design-Builder performs the Utility Relocation, 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.

6.2.2.1 Relocation Schedules

The Design-Builder shall coordinate Relocation schedules with Utility Owners and the Department.

6.2.2.2 Design-Builder Responsibilities

6.2.2.2.1 Relocation Communication

The Design-Builder shall document activities taken by the Design-Builder prior to the Proposal Due Date to coordinate Relocation activities with both private and public 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.

6.2.2.2.2 Other Design-Builder Requirements

Construction of the Project may 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:

- Performance of all tasks, obligations, and duties assigned to the Design-Builder in the Utility Agreements,
- Performance of all Incidental Utility Work,
- Identification and verification of all existing Utilities located within the Right of Way (R/W) or otherwise impacted by the Project.
- Design, construction, and/or inspection costs for all Utility Work for which such responsibility is assigned to the Design-Builder,
- Coordination and schedule verification with all Utility Owners as necessary for all Utility Work,
- Participation in the preparation of all applicable Department Utility Permit Applications for the Utility Work performed by the Design-Builder or by the Utility Owners,
- Identification, verification, and Approval 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 Utility Work excludes those efforts and costs allocated to the Utility Owners in the Utility Agreements. The Utility Work also excludes the following obligations assigned to the Department in the Utility Agreements:

- Collecting payments due from the Utility Owners and/or reimbursing Utility Owners for their costs of performing Utility Work,
- 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 included in the Utility Work 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,
- The proposed resolution for the Utility in the Utility Tracking Report,
- 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.

6.2.1.3 Change in Responsibility

Utility Work included within the scope of the Design-Builder's Work may be deleted from the Work by issuance of a NTO or a separate Change Order providing for the Utility Owner or its contractors to furnish or perform such Utility Work. Also, if requested by a Utility Owner and approved by Department, Utility Work (including Service Lines connecting thereto and temporary Relocations) not included within the scope of the Design-Builder's Work shall be added to the Utility Work by issuance of a NTO or a separate Change Order.

6.2.2 Procedures and Agreements

6.2.2.1 Utilities Identified at the Time of the RFP

The Design-Builder is responsible for participating in all coordination activities with Utility Owners. 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 shall mark the proposed excavation 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, or
- make arrangements with the power company, at Design-Builder's sole expense, to:
 - Temporarily shut off the power,
 - Temporarily insulate the line(s),
 - Bypass the power from the work area, or
 - 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 Utility properties 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.

6.2.2.2 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 and the Utility Owner. Costs for Utility Work related to newly discovered Utilities shall be allocated in accordance with Book 1.

6.2.2.3 Owners with Utility Agreements

The terms of all Utility Agreements and any amendments shall be in the Department’s sole discretion. The Design-Builder shall not have the authority to enter into any Utility Agreements with any Utility Owners on the Department’s behalf. The Design-Builder shall cooperate with the Department at the Design-Builder’s expense in connection with negotiating and preparing Utility Agreements. The Design-Builder shall prepare and provide all written information concerning the Project requested by the Department and shall provide staff to attend negotiation sessions.

6.2.2.3.1 Utility Agreement (UA) / Notice To Owner (NTO)

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 and Department to develop a proposed resolution and pertinent information required for the NTO and UA. The Department and the Utility Owner will then enter into a two party UA to define, negotiate, and order the performance by the responsible party of the Utility Work at the specific location. The UA will also describe applicable terms and conditions for such Utility Work. The Design Builder will have the option to enter into two party agreements with the Utility Owners for 3rd party associated work (i.e., design Relocation plans/Relocate facilities at Utility Owner’s request).

Design-Builder will cooperate with the Department in the NTO process, which may include attending negotiation sessions and obtaining any necessary legal review; however, Department will not be required to incur any other costs associated with the NTO Process.

Each NTO will include the Design-Builder-generated Project design plans (used to identify the conflict) and any applicable design details. Department Utility permits, R/W documents, and/or Utility easement documents for the construction of an affected Utility at a particular location(s) will also be incorporated into the UA.

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

6.2.2.3.2 Utility Conflict Maps

When the Design-Builder has achieved a level of design to determine Utility conflict(s), the Design-Builder shall coordinate with the respective Utility Owner and Department to develop a proposed resolution and pertinent information required for the Utility Conflict Maps. The Department and the Utility Owners will then enter into Utility Agreements to define, negotiate, and order the performance by the responsible party of the Utility Work at each specific conflict location. The Utility Agreements will also describe applicable terms and conditions for such Utility Work.

The Design-Builder shall prepare the Utility Conflict Maps, coordinate the Utility Work and participate in discussions regarding proposed resolutions for Utility conflict(s) with the Department and the Utility Owner regardless of who is doing the Utility Work or who is paying for it. The Design-Builder shall prepare all Utility Conflict Maps and other required materials except for those provided by the Utility Owner. The Design-Builder shall make any changes in the Utility Conflict Maps required by the Department. If approved by the Department, the Design-Builder may prepare one set of Utility Conflict Maps for a group of Utility Relocations.

The Department will cooperate with the Design-Builder in the Utility Conflict Map process, which may include attending necessary meetings; however, the Department will not be required to incur any other costs associated with the Utility Conflict Map process.

Each Utility Conflict Map shall include Design-Builder-generated Project design plans (used to identify the conflict), clouded conflict location(s) and any applicable design details.

6.2.2.4 Utility Permits and Construction Easements

The Design-Builder shall coordinate with the Utility Owner and the Department 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 Relocation, new Utility facility and for Betterments within the Department R/W.

6.2.2.5 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,
- Schedule activity codes corresponding to the Work Breakdown Structure (WBS),
- A brief description of the Utility by size and type,
- The location of the Utility, based upon Project control datum or by station and offset,
- The proposed treatment of the Utility and the date such treatment was Approved by the Department,
- Once a NTO has been issued, 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 Utility Conflict Maps. 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 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 Owners, 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,

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- 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 attempt 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. The Design-Builder shall provide seven Days advance notice to the Department of Design-Builder meetings with Utility Owners. The Department may attend such meetings at its discretion.

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 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 Design-Builder shall negotiate with Utility Owners to determine the schedule necessary to design and/or construct their Utility Work where applicable. These schedules shall be indicated on the Design-Builder's schedule. If a Utility relocation requires a replacement easement, acquisition of the replacement easement shall be subject to the requirements of Book 2, Section 7 and the schedule requirements noted therein.

6.2.3.3 [NOT USED]

6.2.3.4 [NOT USED]

6.2.3.5 Notifications

6.2.3.5.1 Notices to Utility Owners

The Department shall issue all notices to the Utility Owners in accordance with the Utility Agreements and/or the NTO process, whichever is applicable. The Design-Builder shall notify all affected Utility Owners at least 48 hours before commencing any operations that affect a Utility, unless otherwise agreed to in a Utility Agreement.

6.2.3.5.2 Notices Regarding Utility Owner Performance

The Design-Builder shall be responsible for verifying progress of the Utility Owner's work and for notifying the Department should the Design-Builder have cause to believe that the Utility Owner will not meet the specified time frame(s) for any of the following: construction; review of the Design-Builder's plans; comment, review, and approval for NTOs; or inspection. The Design-Builder shall provide such written notice to the Department immediately after discovery.

If the Utility Owner is performing construction, the Design-Builder shall verify that the required Department Utility permit is obtained and complied with. If the Design-Builder determines that the Utility Owner does not have the necessary Department Utility permit or is in violation of the permit or Utility Agreement, the Design-Builder shall notify the Department in writing immediately after discovery.

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. Any assistance provided by the Department, including legal action as described in this Section 6.2.4, will not relieve the Design-Builder of its sole and primary responsibility for the satisfactory completion of all Utility Work and compliance with all other requirements.

In addition to and without limiting its rights pursuant to the preceding paragraph, the Department may, in its sole discretion, decide to take legal action against an uncooperative Utility Owner. The Design-Builder shall cooperate as requested by the Department in connection with such lawsuits, including having the Design-Builder's staff and consultants act as witnesses in such lawsuits and providing information to the Department's counsel at the Design-Builder's expense.

6.2.5 Partnering and Dispute Resolution Procedures

Any disputes that arise between the Department and the Design-Builder shall be subject to the Dispute Resolution provisions set forth in Book 1; however, if the dispute involves a Utility Owner, the Dispute Resolution provisions set forth in Book 1 shall be modified in accordance with this section to include participation by the Utility Owners, or as modified in the applicable UA(s) with the Utility Owner(s).

The Design-Builder and the Department agree that the Utility Owner(s) shall be invited to participate in all partnering activities related to the Utility Work of the affected Utility Owner(s). The Design-Builder, the Department and the Utility Owners may agree to a modified dispute resolution process either in the UA or in a separate agreement.

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 and Standards, and the Environmental Management Plan. The Design-Builder shall be responsible for taking all actions necessary to verify that design 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 (including applicable performance specifications), 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.

6.3.2 Utilities Adjacent to Structures

Underground Utilities shall not be installed within 10 feet of any column footing or pile cap, or within 20 feet from the face of column shafts, unless otherwise approved by the Department.

Installations of all Utilities near structures supported on spread footings shall be subject to the following restrictions:

- When referencing mechanically stabilized earth (MSE) walls, the leveling pad and reinforcing zone shall be considered spread footing elements,

- No Utilities shall be installed below a line extending from the bottom of the footing horizontally for a distance of 3 feet from the edge of the footing and then continuing downward and outward on a 2:1 slope.

Buried Utilities that may produce stray current shall not be installed within 300 feet of any MSE wall unless a corrosion control evaluation is prepared and all necessary corrosion control measures are implemented to properly mitigate the effects of stray current. The corrosion control evaluation and all resulting Design Documents shall be certified by a California-licensed Professional Engineer who is certified by the National Association of Corrosion Engineers.

6.3.3 Investigations

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. 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 include in its investigation potholing as required by the Project Development Procedures Manual, Appendix LL, "Policy on High and Low Risk Underground Facilities Within Highway Rights of Way".

The Design-Builder shall complete its investigations within 90 Days of NTP 1. Upon completion of its investigations, the Design-Builder shall provide updated Utility Plan Sheets and Pothole Matrices to the Department. Once the Design-Builder completes its investigations, all known Utilities shall be assumed to have been identified with "Reasonable Accuracy" as defined in Book 1, Section 6.2.1.1.1.

The Design-Builder shall prepare a Utility Conflict Maps for each Utility impacted by the Project, identifying the location of the existing Utility, the conflicting area, and the final Relocation recommendation to mitigate potential conflict, including, if applicable, the proposed new location (without regard to whether the Design-Builder or the Utility Owner will be furnishing design). The CADD-prepared Utility Conflict Maps shall be attached to each NTO. The information shown on the Utility Conflict Maps shall include the following:

- Existing and proposed R/W,
- Existing topography,
- Proposed Project elements,
- Existing Utilities, and
- Include sufficient information for the Utility Owner to Relocate the Utility, including profile and alignment data as necessary.

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, before beginning construction, 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. The Design-Builder shall furnish the design of all the Utility Work necessary for the Project as stated in the Utility Agreements. The foregoing obligation includes temporary Utility Relocations and all necessary Relocations of Service Lines connected to such Utilities, regardless of the ownership of such Service Lines or of the property served by such Service Lines.

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 UA.

Designs shall be furnished in full accordance with the requirements of the Contract Documents applicable to the Utility Work and the design requirements, including format, of the applicable Utility Agreement(s). In the event of a conflict between the Utility Owner's design standards and the standards or requirements of the Contract Documents, the most stringent standards or requirements will govern. The Design-Builder shall submit its designs to the Utility Owner for written approval by the Utility Owner in accordance with the procedure set forth in the applicable Utility Agreement(s). The Design-Builder shall obtain Utility Owner and Department approval of the Relocation Plans prior to commencement of construction. The Design-Builder shall document the Utility Owner's approval by obtaining a Design Approval Letter from the Utility Owner, and formally submitting a copy to the Department. Upon approval by the Utility Owner, the Design-Builder shall attach the Relocation Plans to the NTO. All subsequent changes to designs will require written Utility Owner approval and shall be shown on the As-Built Documents upon completion of the Work.

6.3.5 Design by Utility Owner

The Design-Builder shall obtain Utility Work Plans from the Utility Owner for all Utility Work 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 Utility Work 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 there are no conflicts when the Design-Builder determines that the location of a Utility does not conflict with the design of the Project. The Design-Builder shall evidence its review and certification that the design complies with the design requirements within the Contract Documents by issuing a Design Approval Letter to the Utility Owner and forwarding a copy to the Department.

6.4 Construction Requirements

6.4.1 Construction by Design-Builder

In each instance where the Design-Builder performs the construction of the Utility Work, 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 UA. 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.

The Design-Builder shall be responsible for restoring infrastructure damaged due to the Utility Work performed by the Design-Builder.

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.

6.4.2 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 Project 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 a Construction Inspection 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,
- Removing Public Utilities from service and leaving these Utilities in place,
- Providing construction survey staking for Utility Relocations.

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 as necessary, and obtaining and complying with all applicable legal requirements and required Governmental Approvals.

6.4.3.1 Protection of Existing Utilities

The Design-Builder shall be responsible for the protection of existing Utilities impacted by the Project, as necessary to ensure their continued safe operation and structural integrity. The protection of existing Utilities may be either temporary or permanent.

6.4.3.2 Utility Removal Work

The Utility Removal Work consists of all Utility Work necessary to remove any existing Utilities 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 In-Place/Out-of-Service Utilities

All underground Utilities that the Design-Builder proposes to take out of use in order to accommodate the Project and/or its construction shall be removed or taken out of service and left in place. Leaving Utilities in place and out of service consists of the Work necessary for each such Utility (including appurtenances) to decommission a Utility that is not removed. Such Utilities shall be taken out of service by installing bulkheads and completely filling the pipe with sand, or by another method Approved by the Department. Bulkheads shall consist of brick and mortar and shall seal the pipe end(s) completely to prevent water infiltration. Any such Utility (including appurtenances) that has an inside diameter of less than 4 inches may be left in place without following such procedures.

The Design-Builder shall make all arrangements and perform all Utility Work necessary to decommission each Utility to be taken out of service and left in place, including, but not limited to, design, construction, and obtaining consent from the affected Utility Owner and any affected landowner(s), as well as any necessary governmental approvals. The Design-Builder shall show all in-place/out-of-service Utilities on the As-Built Documents upon completion of the Work.

6.4.5 Maintenance of Utility Service

The Design-Builder shall take appropriate measures to ensure that all Utilities remain fully operational during all phases of construction to the greatest extent practicable. Necessary interruptions of service shall be described in the NTO, which is subject to the approval of the Utility Owner.

The Design-Builder's proposals for shutdowns and temporary diversions of affected Utility facilities, if approved by the Utility Owner, shall be included in the NTO or Utility Design Sheet.

6.4.6 Betterments

Replacements for any existing Utilities shall be designed and constructed to provide service at least equal to that offered by the existing facilities (unless the Utility Owner specifies a lesser replacement), but may not include any Betterments, unless added to the Utility Work through a NTO. Any proposed Betterments identified in the RID are not part of the Utility Work unless they are identified in a UA attached as exhibits to Book 2. Utility Owners may request Department to permit the Design-Builder to perform additional Work relating to Betterments at the Utility Owner's expense. If the Department approves any such request, then the Design-Builder shall perform such Betterment Work. Upon execution of a NTO by the Utility Owner, the Department, and the Design-Builder, such Betterment shall be added to the Utility Work. Book 1 addresses the Design-Builder's right to a time extension and/or a Contract Price increase for any Betterment added to the Utility Work and sets forth certain additional provisions related to Betterments.

The Design-Builder shall provide all coordination, including all definitive cost estimates and billing information necessary to address requested Betterments.

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 UA 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 Department's invoice, or, in 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.

- Updated Utility Plan Sheets and Pothole Matrices: The Design-Builder shall submit copies of Utility Plan Sheets and Pothole Matrices within 90 days of NTP1. The electronic version of the Utility Plan Sheets shall be submitted in MicroStation CADD and PDF formats.
- Utility Tracking Report: 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 NTP2.
- Utility Conflict Maps: The Design-Builder shall submit six copies to the Department and the Utility Owner two Working Days before the initial NTO meeting.
- Design approval letters: The Design-Builder shall submit a copy of a design approval letter to the Department as an exhibit to each NTO.

Design-Builder's construction inspection approval letter: 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 (R/W)

7.1 General

The Department will acquire all Rights of Way (R/W), permanent or temporary, necessary for the Project in accordance with the *Caltrans Right of Way Manual*. The Department has not identified the need for additional R/W including permanent or temporary easements.

The Design-Builder shall not enter into negotiations for purchase or lease of any property or property rights required to construct Project. The 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 general right of way appraisal - acquisition timelines in this Section 7 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..

Right of possession of the R/W (and upon Final Acceptance the improvements made thereon by the Design-Builder) shall remain at all times with the Department. The 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 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 specified herein or 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	2010 Revised New Standard Plans
10	Department	Standard Plans 2010
11	Department	Design-Build Modifications to the Standard Specifications for Construction
12	Department	Standard Specifications
13	Department	Technical Memoranda

If there are any questions regarding the scope of the Design-Builder's obligations pursuant to the *Right of Way Manual*, the Design-Builder shall be responsible for requesting clarification from the Department. The determination of whether the obligation is mandatory shall be in the sole discretion of the Department.

7.2.2 Meeting Requirements

The 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 *Caltrans 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 reasonable, necessary, 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 the Design-Builder to certify the parcel(s) for access and after all other requirements for Right of Way acquisition have been met, such as performing an environmental document reevaluation. 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 Department policy. The Design-Builder shall notify the Department when the locations to be monumented are prepared in accordance with *Caltrans' 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 Price.

7.4.1 Early Access

Where early access (rights of entry, permits for testing, or similar permissions) are requested by the Design-Build 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 the 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.

It is anticipated that parcels acquired through Condemnation will take an additional nine (9) months after California Transportation Commission (CTC) resolution when the parcel does not require relocation. It is anticipated that parcels acquired through Condemnation will take an additional eighteen (18) months after California Transportation Commission (CTC) resolution when the parcel requires relocation.

8 GEOTECHNICAL

This section shall apply only if the Design-Builder introduces facilities requiring geotechnical designs for bridge foundation, retaining structure, sound wall, overhead sign post, fill/cut slope, culvert, infiltration basin etc..

8.1 General

The Design Builder must perform all Work necessary to meet the requirements of geotechnical subsurface exploration, analysis, design, and construction in accordance with the requirements of the contract documents, and these Technical Provisions.

Design and construct the geotechnical work in accordance with requirements of this specification, including performance requirements, standards and references, warranties, design and construction criteria, maintenance during construction, and required submittals.

8.2 Administrative Requirements

8.2.1 Standards

Perform the geotechnical 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 Department before proceeding with design and/or construction.

Use the most current version of each listed standard as of the Request for Proposal issue date unless modified by Addendum, Change Order or specified herein.

Geotechnical Standards and Requirements

Priority	Agency	Title
1	Department	Seismic Design Criteria
2	AASHTO	LRFD Bridge Design Specifications, (5 th Edition) only for Section 10.5.4
3	AASHTO	LRFD Bridge Design Specifications, (4 th Edition) with California Amendments to the AASHTO LRFD Bridge Design Specifications (4th Edition)
4	Department	Bridge Design Specifications (LFD Version)
5	Department	Bridge Memo to Designers
6	Department	Standard Special Provisions
7	Department	Standard Specifications
8	Department	Standard Plans
9	Department	Soil and Rock Logging, Classification, and Presentation Manual
10	Department	Foundation Report Preparation for Bridges
11	Department	Guidelines for Structures Foundation Reports

12	Department	Guidelines for Preparing Geotechnical Design Reports
13	Department	Corrosion Guidelines
14	Department	California Test Methods
15	ASTM	American Society of Testing and Materials (ASTM) Standards
16	AASHTO	Standard Specifications for Transportation Materials and Methods of Sampling and Testing
17	Department	Independent Assurance Manual
18	Department	Foundation Manual
19	Department	Geotechnical Manual

Information and Procedure Guide

Department	GS Procedure: Report Titles and Guidelines
Department	Implementation of Caltrans 2009 Seismic Design Procedure
Department	GS Procedure: Overhead Sign Foundations
Department	Trenching and Shoring Manual
Department	Code of Safe Practices for Geotechnical Drilling
Department	Plans Preparation Manual

8.2.2 References

Use the references listed below as supplementary guidelines for the geotechnical subsurface exploration, analysis, and design.

Geotechnical References

Agency	Title
FHWA	Checklist and Guidelines for Review of Geotechnical Reports and Preliminary Plans and Specifications
AASHTO	Manual on Subsurface Investigations
FHWA	Subsurface Investigations – Geotechnical Site Characterization
FHWA	Geotechnical Engineering Circular No. 5, Evaluation of Soil and Rock Properties
FHWA	The Cone Penetration Test
FHWA	Pressure Meter Test for Highway Applications
NCHRP	Synthesis 368, Cone Penetration Testing
FHWA	Mechanically Stabilized Earth Walls and Reinforced Soil Slopes Design and Construction Guidelines
FHWA	Geotechnical Engineering Circular No. 2, Earth Retaining Systems

FHWA	Corrosion/Degradation of Soil Reinforcements for Mechanically Stabilized Earth Walls and Reinforced Soil Slopes
FHWA	Manual for Design & Construction Monitoring of Soil Nail Walls
FHWA	Geotechnical Engineering Circular Number 4, Ground Anchors and Anchored Systems
FHWA	Design and Construction of Driven Pile Foundations, Volumes I and II
FHWA	Handbook on Design and Construction of Drilled Shafts under Lateral Load
FHWA	Drilled Shafts: Construction Procedures and Design Methods (FHWA-IF-99-025)
FHWA	Drilled Shafts: Construction Procedures and LRFD Design Methods (FHWA-NHI-10-016)
NCHRP	Synthesis 360, Rock-Socketed Shafts for Highway Structure Foundations
API	Recommended Practice for Planning, Design, and Constructing Fixed Offshore Platforms – Load and Resistance Factor Design.

8.2.3 *Preliminary Engineering Documents*

The Design Builder has the flexibility to make Project changes, but must not impair the essential functions and characteristics of the Project, such as safety, traffic operations, durability, desired appearance, maintainability, environmental protection, drainage, and other permitted constraints.

8.2.4 *Software Requirements*

Use gINT (version 8 or higher) or a compatible computer program to develop and maintain an electronic database of subsurface information and to produce the hard copy of Boring Records. Prepare Log of Test Borings (LOTBs) and drawings by MicroStation or compatible program as the drafting software.

8.2.5 *Equipment Requirements*

Electronic Cone Penetration Test (CPT) cones and Standard Penetration Test (SPT) hammers must be calibrated in accordance with Caltrans Independent Assurance Manual, Procedures for Accreditation of Laboratories and Qualification of Testers.

Electronic Cone Penetration Test (CPT) cone must be calibrated within last 12 months.

Standard Penetration Test (SPT) hammer must be tested for energy efficiency within last 12 months, and with energy efficiency ratio reported in the boring logs and boring records.

Submit a copy of the hammer and CPT calibration with the geotechnical reports.

8.2.6 *Personnel Requirements*

The Design-Builder must provide a geotechnical team that includes, at a minimum, one Professional Engineer (with Civil or Geotechnical Engineer License) and one Certified Engineering Geologist, both licensed in the State of California. The team leader must be a Professional Engineer (with Civil or Geotechnical Engineer License) licensed in the State of California. The team leader must have a minimum of fifteen years of recent experience in matters relating to geotechnical subsurface exploration; geotechnical analysis; design; and construction of bridge foundations and retaining walls

8.2.7 Certification Requirements

Perform all laboratory tests and testing equipment calibration at AASHTO Materials Reference Laboratory (AMRL) - accredited facilities for the geotechnical tests and equipment calibration required by this section.

8.3 Design Requirements

8.3.1 Geotechnical Execution Plan

The Design Builder must prepare a Geotechnical Execution Plan (GEP) and a list of geotechnical milestones and scheduled meetings associated with the milestones based on the preliminary Geotechnical Execution Plan submitted with the Proposal.

GEP must identify required geotechnical efforts for the design and construction of the Project.

GEP must discuss, but not limited to, the following aspects:

- Geotechnical design and construction issues,
- Assessment of potential bridge foundation and earth retaining system types,
- Planned subsurface exploration program,
- Planned geotechnical design methodologies and schedule, and
- Planned instrumentation and monitoring programs.

The Design-Builder must submit the draft GEP for review. Schedule a meeting, within fourteen (14) days of the submittal of the draft GEP to present and discuss the geotechnical concept; the geotechnical needs of the Project; the draft Geotechnical Execution Plan; and the meeting schedule.

The Design-Builder must submit Final Geotechnical Execution Plan for review and record.

8.3.2 Geotechnical Subsurface Information

The Design Builder must obtain geotechnical subsurface information by performing geotechnical subsurface exploration necessary for the geotechnical design and construction of the Project.

For bridge foundation design, perform minimum one boring and/or CPT at each bridge support location and two borings and/or CPTs at bridge support location over 100 ft in width.

For each retaining wall, perform minimum one boring and/or CPT spaced every 250 ft. Perform minimum one boring and/or CPT for wall length less than 150 ft and minimum two borings and/or CPTs for wall length between 150 ft and 500 ft. For MSE and Soil Nail Walls, perform additional borings and/or CPTs at a distance of 1.0 to 1.5 times the height of the wall behind the wall face spaced at 250 ft.

For each sound wall, perform minimum one boring and/or CPT spaced every 500 ft. Perform minimum one boring and/or CPT for wall length less than 250 ft and minimum two borings and/or CPTs for wall length between 250 ft and 1000 ft. The Design-Builder must perform a minimum of one soil boring for each overhead sign post support location.

For culverts greater than 30 inch span or diameter, perform minimum one boring and/or CPTs spaced every 100 ft. Perform minimum one boring and/or CPT for culvert length less than 100 ft and minimum two borings and/or CPTs for culvert length between 100 ft and 200 ft.

Perform minimum six (6) infiltration test holes for each infiltration basin.

8.3.3 Geotechnical Subsurface Exploration

8.3.3.1 Drilling

The Design-Builder must perform drilling in accordance with ASTM Standards and other applicable standards.

8.3.3.2 Cone Penetration Test

The Design-Builder must perform Cone Penetration Tests (CPT) in accordance with ASTM D5778. Data to be collected includes raw and corrected tip resistance, side friction and excess pore water pressure. This data must be collected electronically and presented in graphical format that includes an interpretation of the soil behavior type index and soil behavior type.

8.3.3.3 Geotechnical In-Situ Test, Instrumentation and Geophysical Exploration

Install geotechnical instruments to monitor and record integrity of excavated face during soil nail wall or anchor tieback wall construction, and displacement of soil nail walls and anchor tieback walls after construction.

Install geotechnical instruments where and when necessary. Replace or recalibrate instruments that are damaged during construction within 5 days.

8.3.3.4 Borehole Site Cleanup

Backfill borehole, after drilling or CPT sounding, with a cement bentonite grout mix or bentonite hole plug, and asphalt or concrete to match existing pavement if borehole is at pavement.

8.3.3.5 Geotechnical Laboratory Test

The Design-Builder must perform tests in accordance with California Test Methods (CTM) or American Society for Testing and Materials (ASTM) Standards.

8.3.3.6 Sample Retention and Transfer

The Design-Builder must keep soil and rock samples until at least completion of Project".

8.3.4 Geotechnical Reports

Prepare and submit Preliminary Geotechnical Design Reports (PGDRs), Geotechnical Design Reports (GDRs), Preliminary Foundation Reports (PFRs) and Foundation Reports (FRs). Prepare separate Preliminary Foundation Reports and Foundation Reports for each bridge when new, replacement, retrofit, or modifications to existing bridges are to be constructed. Prepare and submit Foundation Reports for each special design retaining wall.

Submit Preliminary Geotechnical Design Reports (PGDRs) and Preliminary Foundation Reports (PFRs) with as-built and available LOTBs for type selection bridge submittal and/or special design retaining walls.

Submit Geotechnical Design Reports, Foundation Reports, addenda, and revisions with contents in accordance with Section 8.5, for review. Sign and seal the reports by the Civil or Geotechnical Engineer and the Certified Engineering Geologist who performed the work on the reports, both licensed in the State of California.

The construction of subject bridge structure, retaining wall, slope, or embankment, must not be started prior to the approval of the subject geotechnical reports in the 100% design packages and until the Design Builder receives a notice of Released for Construction. If such work is performed before such notice is provided, it must be at the sole risk of the Design Builder.

8.4 Construction Requirements

8.4.1 Bridge Foundation Test

Driven Pile:

For pile diameter less than 18 inches, the pile nominal resistance shall be determined based on the Gates formula in accordance with the Caltrans Standard Specifications.

For pile diameter from 18 inches up to 36 inches: Perform one Pile Dynamic Analysis (PDA) Test for each Control Zone to verify pile nominal resistance. A Control Zone is a zone that has the same subsurface profile and engineering properties. Develop acceptance criteria for the Control Zone by using the PDA test result and the Wave Equation. Submit Driving System Submittal 14 days before pile driving.

For pile diameter greater than 36 inches, including Cast in Steel Shell (CISS): Perform one PDA test and one-static axial pile load test for each Control Zone to verify pile nominal resistance. A Control Zone is a zone that has the same subsurface profile and engineering properties. The acceptance criteria are in accordance with the provisions in Sections 10.7.3.8 and 10.7.3.10 of the California Amendments to the AASHTO LRFD Bridge Design Specifications for compression and tension, respectively.

For driven H-pile, the pile nominal resistance shall be determined in accordance with Caltrans' Standard Specifications.

CIDH Pile:

The construction of the CIDH piles shall follow all Caltrans requirements including integrity testing of the CIDH piles using Gamma-Gamma test in accordance with California Test Method 233. All mitigation of detected anomalies shall require review and approval by Caltrans Engineering Services CIDH Pile Mitigation Committee.

Pile load test on CIDH may be omitted if the piles are designed not exceeding the recommended maximum Side resistance and/or Base resistance in accordance with "Drilled Shafts: Construction Procedures and Design Methods, FHWA-IF-99-025 (FHWA, 1999).

Perform pile load test on a non-production pile with a minimum of one test per control zone to verify axial capacity. Perform pile load test in accordance with FHWA-NHI-10-016 (FHWA, 2010), Chapter 18 Specifications, Section X.6 (pages 18-49 to 18-50).

Both conventional pile load testing and bi-directional Osterberg Cell ("O" Cell) method is permitted. O-Cell method is discussed in FHWA-NHI-10-016 (FHWA, 2010), Drilled Shaft Manual Section 17.2.2.2 Bi-directional (O-Cell) tests. Perform test and prepare report in accordance with FHWA-NHI-10-016 (FHWA, 2010) Chapter 18 Specifications, Section X5.3 (pages 18-45 to 18-48).

Provide the pile load test program, construction and pile load test specifications to Department for review and approval 21 days prior to performing pile load test. The test pile and pile load test shall be completed and accepted by the Department before construction of any production piles. Test piles shall be sacrificial and shall not be used as production piles. After completion of a pile load test and the test pile is no longer needed, it shall be cut off 2 feet below final grade.

8.4.2 Soil Nail Wall Requirements

Follow Caltrans Standard Special Provisions for Soil Nail Wall (Earthwork) and (Nails).

Identify wall zones, with one Design Pull out Resistance assigned for each wall zone, on the Plans.

Perform two verification tests on each wall zone before starting excavation for the wall zone.

Perform proof tests on sacrificial proof test nails. The number of sacrificial proof test nails must be no less than 10% of the total number of designed soil nails.

Show the locations of eighty percent of the proof test nails on the Final Design Drawings. The locations of remaining twenty percent of proof test nails must be determined during construction.

8.4.3 Instrumentation

Develop and submit an Instrumentation and Monitoring Plan to verify damages to existing structures, slopes and other facilities due to his construction activities. The Instrumentation and Monitoring Plan must include:

- Initial survey of existing structures,
- Noise,
- Vibration,
- Settlement and settlement rates of embankments,
- Inclometers,
- Stability and displacement of walls and slopes, and integrity of excavated face during soil nail wall or anchor tieback wall construction,
- Others as needed.

Replace or recalibrate any instruments damaged or no longer functioning within five (5) days of such discovery of such damage. Submit an Instrumentation and Monitoring Plan for approval.

8.5 Deliverables

The Design Builder must develop Released for Construction (RFC) Documents, and As-Built Plans and Final Documents in accordance with the requirements of this section.

8.5.1 Geotechnical Subsurface Information

Submit geotechnical subsurface information in both hard copy format and electronic format that is in compliance with the required Department database format. The database of subsurface information must be recorded, maintained, and submitted using gINT or comparable software.

Subsurface information obtained must be recorded and reported in accordance with the following:

- Caltrans Soil and Rock Logging, Classification, and Presentation Manual, and
- Data Interchange for Geotechnical and Geoenvironmental Specialists (DIGGS) Schemas and Data Dictionaries.

Subsurface information must be submitted along with applicable Geotechnical Reports. The subsurface information that must be submitted includes:

- Boring and Sampling:
 - Field log of each bore hole performed,
 - Final Borehole Log or Borehole Record of each bore hole performed,
 - Log of test boring Sheets for each Bridge structure and all retaining walls including soil nail walls, tieback walls and MSE walls,
 - Digital photo logs of rock core samples with associated rock core information shown on each digital photo,
 - Test report of energy efficiency ratio of Standard Penetration Test (SPT) hammer for each drill rig used to drill the bore holes.

- CPT Sounding:
 - An electronic copy of the CPT raw data and hard copy CPT logs for each CPT performed,
 - Calibration report of electronic CPT cone,
- Geotechnical In-Situ Instrumentation:
 - Results of geotechnical in-situ instrumentation tests performed.
- Geophysical Test:
 - Results of geophysical tests performed with interpretation report.
- Laboratory Test:
 - Results of laboratory tests performed.
- Survey data of bore hole, CPT, In-Situ instrumentation, and geophysical test locations, including elevation, strata information, northing and easting, converted latitude and longitude, and station and offset.

8.5.2 Analysis and Design Calculation

Submit applicable analysis and design calculations including both hardcopy and electronic files, along with each geotechnical report as appendices for review. The person who performed the calculation must sign each calculation package. Each calculation package must be independently checked and reviewed; and the checker and reviewer must initial each calculation package.

8.5.3 Geotechnical Reports

The Design-Builder must submit a hardcopy and an electronic copy of geotechnical reports, including Geotechnical Execution Plan, Geotechnical Design Reports and Foundation Reports, for review.

The reports must include geotechnical subsurface information, geotechnical laboratory test results, analyses, design, recommendations, and associated documents in accordance with Caltrans Soil and Rock Logging, Classification, and Presentation Manual; Caltrans Foundation Report Preparation for Bridges; Caltrans Guidelines for Structures Foundation Reports; and Caltrans Guidelines for Preparing Geotechnical Design Reports.

Incorporate existing information, including information provided by Department, in the reports as applicable.

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 Department Standards exist for survey activities, such surveying shall be done in accordance with 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 Design-Builder 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. If additional primary control is needed the Design Builder will consult and get concurrence from the Department on the methodology and establishment of additional primary control.

The Design Builder shall match existing pavement as control except where noted in this RFP.

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 otherwise specified herein or 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 Data Committee (FGDC)	Geospatial Positioning Accuracy Standards, Part 3. 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 Caltrans 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

Minimal verified survey data exists for this project.

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

- Right of Way mapping.

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 Caltrans Safety Manual and the Caltrans 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 Caltrans Surveys Manual and all other specifications described in the Caltrans 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 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 [NOT USED]

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 Caltrans 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 Caltrans 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 Caltrans 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 Department software and operating systems. Mapping shall conform to the Caltrans Plans Preparation Manual and the Caltrans 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 Caltrans 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 perform all Work necessary to meet the requirements of earthwork, including clearing and grubbing; excavation and embankment; removal of buildings, pavement, pavement markings, and miscellaneous structures; subgrade preparation and stabilization; dust control; aggregate surfacing; and earth shouldering in accordance with the requirements of this Section 10 and the standards below.

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.

Use the most current version of each listed standard as of the Request for Proposal issue date unless modified by Addendum, Change Order, or specified herein.

<i>Priority</i>	<i>Author or Agency</i>	<i>Title</i>
1	Department	Highway Design Manual (HDM)
2	Department	Standard Special Provisions
3	Department	Standard Plans
4	Department	Standard Specifications
5	Department	Technical Memoranda
6	Department	Construction Manual

Remaining standards listed in Book 3.

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

<i>Agency</i>	<i>Title</i>
Department	Construction Procedures Directives
Department	Construction Policy Bulletins
Department	Standard Test Methods – Volumes 1, 2 & 3
Department	Plans Preparation Manual

10.2.3 Software

The Design-Builder shall prepare grading plans in MicroStation by Bentley on a version compatible with the version in use by the Department on the date of the Final RFP.

10.3 Design Requirements

10.3.1 Grading Concept Meeting

The Design-Builder shall schedule and participate in a grading concept meeting to present a layout of the in-place and proposed grading on the Project. The Design Builder shall use the outcome of the meeting to finalize the grading needs of the Project.

10.3.2 Grading Requirements

The Design-Builder shall provide grading plans and shall be responsible for ensuring that the final grading is consistent with all Contract requirements, including environmental, landscape, visual quality management, stormwater, roadway design, and geotechnical requirements. Erosion control and site protection treatments shall be provided by Design-Builder for all areas where grading is performed.

10.3.3 Slope Rounding

Slope rounding is required on all cut slopes and fill slopes, unless the context requires otherwise, as determined at the sole discretion of the Department. Grading contours shall blend with the natural contours of the site. Landforming shall be incorporated, avoiding distinct edges and feathering fill areas into existing contours.

10.4 Construction Requirements

The Design-Builder shall remove all existing pavement, curb and gutter, sidewalk, steps, drainage facilities, soil, rock, and other obstructions within the Project limits necessary to construct the Project. The Design-Builder shall remove all unused pavements and sidewalks within the Project limits. When removing such items, the Design-Builder shall saw cut the pavement or sidewalk full depth with neat lines at the removal terminations.

10.4.1 Salvaged Items

The following items shall be salvaged where removal is necessitated by the Project:

- Metal Beam Guard Railing, Rail Element only (No hardware)
- Metal Beam Guard Railing Steel Posts
- Metal Bridge Railing Elements (No hardware)

Except as otherwise provided for damaged materials in Section 15-2.04, "Salvage" of the Standard Specifications, the materials to be salvaged shall remain the property of the State, and shall be cleaned, packaged, bundled, tagged, and hauled to the former Fontana Safety Roadside Rest Area and stockpiled. The former Fontana Safety Roadside Rest Area is located on westbound I-10, near Postmile 14.4 (west of Citrus Ave)

The Design-Builder shall notify the Department and the District Regional Recycle Coordinator, telephone (909) 877 - 9209 a minimum of 48 hours prior to hauling salvaged material to the Recycle Center.

10.4.2 [NOT USED]

10.4.3 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 pavements, sidewalks, minor structures and obstructions, fencing, pipes, culverts, abandoned automobiles, furniture, appliances, garbage, and other waste materials. No removals shall take place on a parcel until the Design-Builder receives written notification from the Department allowing access to that parcel, as noted in Section 7.1 of this Contract.

Where removal of metal beam guard railing is necessitated by the Project, existing concrete anchors and steel foundation tubes included in the portion of metal beam guard railing to be removed shall be completely removed and disposed of.

The top portion of drainage inlets to be abandoned and concrete foundations of sign structures to be removed shall be removed to a minimum depth of 3 feet below finished grade.

10.4.4 Remediation Work

If as a result of the hazardous material assessment, it is determined that contaminated materials are present within the project limits and require remediation, the Design-Builder shall perform the remediation work, subject to the terms and requirements of Book 1, Section 13.10.

The Design-Builder shall contract with a licensed subcontractor to perform this work. The Design-Builder shall prepare a Hazardous Materials Management Plan for removal, disposal, and/or remediation of contaminated or hazardous materials. The Hazardous Materials Management Plan shall, at a minimum, state type of contaminated or hazardous material encountered; how it will be handled; if material will be reused or disposed of; and if disposed, where it will be transported. The Hazardous Materials Management Plan shall be submitted prior to proceeding with demolition activities.

Refer to the Environmental Section of the Technical Provisions for additional information on Hazardous Materials.

10.4.5 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.

10.4.6 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 Department for Approval and must receive Department Approval before mining any material within Department R/W. 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 Department R/W, the Design-Builder shall submit a Disposal Site Plan to 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 5 days following contract acceptance. Contact information for the Department and statewide recycling coordinators is available via the following Internet address: <http://www.dot.ca.gov/hq/oppd/rescons/sb1016/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 perform all Work necessary to meet the requirements of roadways. Roadway classifications include but not limited to mainline, acceleration lanes, deceleration lanes, auxiliary lanes, collector/distributor roads, truck/climbing lanes, ramps, frontage roads, county roads, city streets, and private streets.

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 as determined by the Department, 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.

The Design-Builder shall use the most current version of each listed standard as of the Request for Proposal issue date unless modified by Addendum, Change Order, or specified herein.

Roadway Standards

Priority	Agency	Title
1	State	California Manual of Uniform Traffic Control
2	Department	Highway Design Manual (HDM) as approved on May 7, 2012
3	Department	Traffic Manual, Chapter 7
4	AASHTO	Policy on Design Standards – Interstate System
5	AASHTO	Policy on Geometric Design of Highway and Streets
6	Department	Standard Special Provisions
7	Department	Standard Specifications
8	TRB	Highway Capacity Manual
9	Department	Project Development Procedure Manual
10	Various Agencies	Technical Memoranda
11	Department	Standard Plans

Remaining standards set forth in Book 3

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 Environmental Document

NCHRP	Report 350-Recommended Procedures for the Safety Performance Evaluation of Highway Features
AASHTO	Roadside Design Guide
Department	Ready to List and Construction Contract Award Guide (RTL Guide)
Department	Cross Section Preparation and Delivery (Memo dated July 30, 2004)

11.2.3 [NOT USED]**11.2.4 Typical Cross Sections**

The Exhibit 11-B, Typical Cross Sections shows the rehabilitation concept of the Project. The outermost two lanes shall be replaced. The outermost lane shall be widened outwards beyond the ETW by two feet. The lane adjacent to the outer most lane shall be widened inwards by 0.5' beyond the lane line. See Section 21, Pavements, for more technical information

11.2.5 Software

The Design-Builder shall prepare drawings in MicroStation on a version compatible with the version in use by the Department on the date of the Final RFP.

The Design-Builder shall use AutoTurn by Transoft Solutions.

11.2.6 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 Roadway Work during the design and construction stages. The requesting party shall provide the other parties with not less than five (5) Working Days prior notice of such meetings. The Design Builder shall prepare and distribute to all attendees a record of the minutes to the meeting within five (5) Working Days of the meeting.

11.2.7 Training and Certification Requirements

The Design-Builder shall have at least one Roadway Design Engineer, working under the Design Lead Engineer (Roadway Engineer of Record), with at least 5 years of design experience designing roads, ramps, connectors, etc. on the California State Highway System. This Roadway Design Engineer shall be licensed as a Professional Civil Engineer in California.

11.3 Design Requirements**11.3.1 Performance Requirements**

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 2055 design year,

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, superelevation, 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 prepare all necessary engineering studies and applicable design reports to justify all project roadway elements used in the project.

I-15 mainline within the project limits is part of the Extralegal Load Network (ELLN). The existing minimum vertical clearances on the Route 15 mainline within the project limits shall be maintained. These vertical clearance requirements apply during construction as well as at project completion, unless a

Department-approved detour for extra-legal loads is provided. If a Department-approved detour for extra-legal loads is provided, minimum vertical clearance on I-15 may be reduced during construction to 15 feet. Where applicable standards or other portions of this contract require greater clearances than the existing clearances, the greater clearance shall govern for all new construction.

All structures spanning the southbound I-15 roadbed (excluding sign structures) shall provide clear span (edge of shoulder to column face) for an additional 50 feet of future pavement parallel to the inside of the southbound I-15 roadbed, without requiring the replacement of the structure.

The following spot improvements will also be performed:

- Upgrade guardrail height and terminal height to the current standard as needed. The locations are listed but not limited to the following:
 - Approach flares at PM R20.3 (NB), R21.2 (NB)
- Extension of terminal system some 12' at Post Mile (PM) R20.0 (SB) to better shield the existing control box
- Drill break away holes in the sign post located at PM R26.0 (SB),
- Replace damaged guardrail elements at the following locations:
 - Northbound: R17.9, R18.25, R18.85, R18.9, R23.94, R24.77,
 - Southbound: R24.2, R22.2,
- Replace the existing K-rail along the median with concrete barrier at the following post mile locations:
 - Northbound: R16.0-R18.48, R18.53-R19.29, R19.3-R20.2, R20.24-R20.32, R20.34-R21.37,
- Close the gaps of MBGR along the southbound inside shoulder from PM R22.98 to R25.85. And place asphalt concrete dike (Type F) and implement vegetation control along the proposed MBGR locations. Remove the existing flared end system to match the existing MBGR and the proposed MBGR,
- Shift guardrail so that it is flush with face of the dike, the locations are, but not limited to the following:
 - NB: PM R20.3
- SB: PM R14.95, R20.8, R23.2, and R28.0/R29.0,
- Install guardrail at the outside embankment locations listed as follows: R18.5-R18.6 (NB), R19.1 (NB), R21.9(NB), R21.75-R22.05 (NB), R24.3 (NB), R19.2 (SB), R18.5 (SB), R26.6 (SB), R25.2 (SB), R23.3-R23.5 (SB), R23.2-R23.3 (SB), R22.9-R23.0 (SB), R19.73-R19.6 (SB), R19.5-R19.6 (SB), R26.2 (SB Off to truck Safety Check Area),
- Place post mile markers at the following locations: NB R17.00, R24.00, R24.50,
- Remove raised islands and pave the gore areas with the outside lane pavement structure at the following locations: R20.62 (NB), R20.8 (SB), at the Truck Scale exits
- Replace damaged W51 Sign at PM R22.7 (NB)
- Place rumble strips along the inside and outside shoulders throughout the project limits,
- Grind all PCC pavement per Section 21, "Pavement" in Book2,

The existing treated MBGR wood post shall be disposed per the NSSP in Book 3.

See Section 21, "Pavement", for detailed description of pavement work. Loop detectors, wiring, pull boxes and other ITS, electrical elements impacted by Roadway work shall be restored per Section 16 & 17.

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

PROJECT-SPECIFIC DESIGN STANDARDS

Roadway:	I-15 Mainline
Location:	From I-15 PM 15.4 to I-15 PM 30.8

Design Standards	Freeway Mainline
Jurisdictional System	Caltrans
Functional Class	Freeway
Access Control	Full
Highway Type	Multi-Lane Divided, Urban Section
Design Vehicle	STAA
Terrain	Mountain
Project Posted Speed	70 mph
Design Speed	80 mph
Shoulder Bus Use	No

TRAFFIC VOLUMES

Freeway Segment	AADT		
	2015	2035	2055
I-15 Northbound			
PM R15.4 to R21.37	91,000	134,700	170,000
PM R21.37 to 29.80	77,000	117,000	148,700
I-15 Southbound			
PM 29.80 to R21.37	72,100	101,600	126,600
PM R21.37 to R15.40	87,100	127,500	160,600

MEDIAN TYPES

11.3.1.1 Slopes

All side slopes shall be designed in accordance with the Highway Design Manual.

Slope rounding is required on all cut slopes unless otherwise permitted in this Contract. Land forming shall be incorporated, avoiding distinct edges and feathering fill areas into existing contours.

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 *Caltrans Standard Specifications* and the *Caltrans Standard Plans*.

Metal beam guard railing (MBGR) shall be installed on the top of high fill slopes within the clear recovery zone, where the conditions of Traffic Manual Section 7-03.4 are met. Existing fill slopes within the project limits shall be evaluated and protected with MBGR if the aforementioned criteria are met the Design Builder

shall use galvanized steel posts for all metal beam guardrail and thrie beam installations unless otherwise approved by the Department. Any guardrail or thrie beam end treatment installations that have not been crash tested using steel posts 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 treatments set forth in the project Visual Quality requirements section in these technical provisions.

11.3.1.3 [NOT USED]

11.3.1.4 [NOT USED]

11.3.1.5 [NOT USED]

11.3.1.6 Clearing and Grubbing

Clearing and grubbing Work shall not start prior to NTP2.

11.3.1.7 [NOT USED]

11.3.1.8 Temporary Facilities

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 with following exceptions:

- Lane widths may be reduced to 11 feet, except for the outermost lane (which must be a minimum of 12 feet wide),
- Shoulder widths may be reduced. A minimum shoulder width of 2 foot shall be maintained for all inside shoulders. The outside shoulder requirements are specified in Section 18 Maintenance of Traffic

Exceptions to design standards for all other temporary roadway facilities shall be approved by the Department prior to construction. Approval is at the sole discretion of the Department.

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

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.

11.3.2 Design Exceptions

The Department discourages creating exceptions, and will not consider exceptions for modest benefits.

The Department may consider exceptions from standards or criteria on a case-by-case basis, at specific locations where the Design-Builder demonstrates that substantial benefit to the Department and the public would accrue from the recommendation. Obtain the 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 the 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 the Department and FHWA and are described below. The Design Builder shall submit the final mandatory design exceptions for approval by the 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 the 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, or deviates farther from the applicable standard of an existing design exception, 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 the 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)

The process for mandatory design exceptions is shown in Exhibit 11-A, Design Exception Process Flowchart.

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. Some elements of the design developed in the preliminary design may not meet these design requirements. For these variances, advisory design exceptions have already been approved by the Department and are described below. The Design Builder shall submit the final design exceptions for approval by the Department.

The Design Builder is discouraged from creating additional advisory design exceptions, since there is no assurance that they will be approved by the Department; however, elimination of existing design exceptions by the Design Builder is encouraged. If the Design Builder's design creates additional design exceptions, or deviates farther from the applicable standard of an existing design exception, 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 the 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 the Department's District Approval. The Geometrician and FHWA approval are not necessary for an Advisory Design Exception.

Upon receipt of the design exception request, the Department will review and if deemed acceptable, approve the request. The process for advisory design exceptions is shown in Exhibit 11-A, Design Exception Process Flowchart.

11.4 Construction Requirements

Construction shall be in accordance with the requirements of the Department's standards, which include the Standard Specifications, Special Provisions and the Standard Plans.

11.4.1 Guard Railing, Thrie Beam Barrier, Metal Beam Barrier

At locations exposed to public traffic where guard railings or barriers are to be constructed, reconstructed, or removed and replaced, schedule operations so the work occurs at the end of each working day and there are no post holes open or any railing or barrier posts installed without the blocks and rail elements assembled and mounted.

11.5 Deliverables

The Design-Builder shall develop Released for Construction (RFC) and As-Built Documents in accordance with the requirements of this section.

11.5.1 Released for Construction Documents

The Design-Builder shall produce plans and specifications in a format that aids and facilitates design review by the Department. Design calculations and justifications related to a RFC plan set may be required by the Department prior to the Department approval. Designs shall be developed in accordance with the Caltrans CADD Manual, Caltrans Plan Preparation Manual, and the Design Quality Management Plan before construction may begin. The Department approval for RFC plans is required.

The following list of RFC plans and specifications, 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,
- Superelevation plans,
- Construction Detail Plan,
- Contour Grading Plan,
- Drainage Plans, Profile and Details,
- Utility Plans,
- Stage Construction and Traffic Handling Plan,
- Detour Plans,
- Construction Area Signs Plan,
- Pavement Delineation Plans,
- Retaining Wall Plans, Details and Quantities,
- Sound Wall Plans, Details and Quantities,
- Planting and Irrigation Plans, Details and Quantities,
- Signals, Lighting and Electrical Systems Plan,
- Roadway cross-sections,
- Specifications and special provisions.

11.5.2 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. As-built documents must be submitted in both hardcopy and electronic form. The as-built documents 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 the Department),
- Reports/Project documentation,
- Specifications and Special Provisions.

11.5.2.1 Plans

As-Built Plans shall include the following in compliance with the *Caltrans Plans Preparation Manual*:

General Requirements (All Sheets)

- Stationing and beginning and end of construction,
- Roadways labeled,
- Scale, north arrow, legend,
- References to other sheets (i.e., See Sheet No. xx),
- Text reads from left side of the sheet or from the bottom of the sheet,
- All text is legible with no text overlapping or lines going through text,
- Drawn by: and Checked by: Initials included,
- Sheet title in lower right,
- State Project and State Aid Project numbers (SP and SAP),
- File name, plot name, and date and time of plot at lower left,
- Complies with *Caltrans CADD Manual* standards (i.e., level, line style, line weight, text size, cells, etc.).

Bedding Details

- Show typical section treatment type, pipe size, slopes, and dimensions,
- Tabulate locations.

Title Sheet

- Show: necessary station equations (only for the alignment that the length is based on); gravel pits and pit data, if applicable; scales at lower left; federal and governing specifications at upper right; Project number at upper right; index with sheet numbers,
- Provide: signature block with appropriate signature lines; Work description; index map with legible names of major streets, roadways and other features; design designation; design exception information for each roadway; Project location information at lower middle; length/limits of Project based on northbound or eastbound alignment; north arrow and map scale,
- Label: counties; cities; sections/townships/ranges; bridges; CSAHs or county roads referred to as such (not just as city street names).

General Layout

- Show: locations of plan-view sheets (construction, paving, intersections, drainage); existing roadways; bodies of water; significant land features/topography; noise walls,
- Label: proposed and existing roadways; bodies of water; cities; plan sheets; noise walls.

Earthwork Tabulation and Summary

- Show: excavation and embankment volumes tabulated by alignment for purposes of determining testing rates.

Typical Sections

- Show: proposed and existing finished surfaces; grading sections; pavement and backfill structure; R/W and subsurface drainage,
- Label: roadway centerlines; profile grade; grading grade; existing ground; slopes; curbs; station limits,
- Dimension: roadway dimensions; dimensions to grading PIs; subcut and muck excavation depths.

Standard Plan Sheets

- Standard Plans placed in numerical order,
- The version of Standard Plans sheets in existence at the Proposal Due Date shall be used,
- If any revision has been made to a Standard Plan sheet, the sheet shall include the “Drawn By” and “Checked By” initials, Engineer’s certification, and the word “Revised” added at the lower right corner of the sheet.

Alignment Plan

- Provide: description of horizontal control; alignment and curve data (Δ , degree of curve, radius, tangent length, curve length, azimuth); x , y coordinates at all alignment points (PI, PC, PT, CC, begin and end points, equations),
- Label: alignment names; stationing; control points; roadway names; point equivalents; beginning and end of alignments; R/W boundaries.

Construction Plans

- Label: alignments; curbs; pedestrian ramps; medians; traffic arrows; locations of standard plates used; walls; bridges; existing features; environmentally sensitive areas; R/W and easements; construction limits,
- Dimension: roadway; shoulder; paths/walks; tapers; intersection radii.

Intersection Details

- Label: alignments; curb types; pedestrian ramps; medians; traffic arrows; locations of standard plates used; walls; bridges; existing features; R/W and easements; construction limits; curb radius centers and tangent points; gutter grades and spot elevations, if applicable.

Profiles

- Provide: vertical control note indicating datum and benchmarks,
- Label: grades; PVC/PVI/PVT information; design speed met; high and low points; beginning and end points; tie-in points; intersections with other alignments; profile grade; grading grade; ditch grades; existing ground line; bridges,
- Label: grades; spot elevations; high and low points of all gutter profile lines along the Project,
- Dimension: subgrade excavation depth and tapers.

Paving Plans and Details

- Show: coordinate grid ticks and labels (minimum of three per sheet); plan sheet location box (on projects with complicated plan sheet layouts); note(s) referring to details,
- Label: roadway alignments; stationing; curb type; medians; joints; headers; bridges; stations of end points; and reinforced panels over culverts (patterned),
- Dimension: panels; pavement thickness; taper rates (1:x, not x:1); shoulders.

Superelevation Plans

- Show: superelevation transition patterns and, if needed, superelevation profile diagrams,
- Label: alignments; walls; bridges,
- Dimension: roadway and shoulder widths; slopes; transition end points,

Fencing Plans

- Label: stationing; walls; bridges; existing railroads; lakes and rivers; environmentally sensitive areas; R/W and easements; existing and proposed fence data (types, locations, details, and gates); coordinate grid ticks and labels (minimum of three per sheet),

- Dimension: R/W to fence.

Cross-Sections

- Show: existing and proposed Utilities; existing and proposed R/W and easements; retaining walls,
- Use a horizontal and vertical scale of 1:50, and intervals not greater than 50 feet. Comply with the “Cross Section Preparation and Delivery” memo dated July 30, 2004.

11.5.2.2 Design Calculations

Design calculations shall include, but not be 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): Include an electronic MicroStation file showing AutoTURN wheel paths, a clearly-labeled vehicle path, and vehicle profile (using the AutoTURN ‘insert profile’ command),
- Clear zones,
- Superelevation,
- Traffic barrier, end treatments, and impact attenuators,
- Retaining Wall,
- Sound Wall,
- Earthwork,
- Structures.

11.5.2.3 Design Justification

Upon request by the 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.

11.5.2.4 Non-Standard Specifications and Special Provisions

The Design-Builder shall request the Department’s approval to utilize methods or materials that are not Department standards. Such requests shall include comprehensive specifications and provisions associated with the proposed non-standard methods or materials. Approval of such requests is at the sole discretion of the Department.

EXHIBITS

- Exhibit 11-A: Design Exception Process Flowchart
- Exhibit 11-B: Typical Cross-Sections

These exhibits are provided as electronic files.

12 DRAINAGE

12.1 General

The Design-Builder shall perform all Work necessary to meet the requirements associated with drainage, including culverts, bridge hydraulics, roadway ditches, flood control facilities, permanent and temporary stormwater management systems (including retention/detention facilities, structural pollution control devices, debris basins), and closed storm drain systems. The Project is not to permanently improve the existing drainage conditions except some spot drainage improvements as described in Section 11, Roadway. Before changing dike Type A to Type F, the drainage capacity of the dike Type F shall be analyzed. If the drainage capacity of Type F cannot meet the requirements, Type A dike shall be used.

12.2 Administrative Requirements

12.2.1 Standards

As necessary design and construct the spot drainage improvements within the project environmental footprint in accordance with the relevant requirements of the standards listed, in order of 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 Request for Proposals issue date unless specified herein or modified by addendum or change order.

Drainage Standards

Priority	Agency	Title
1	Department	Highway Design Manual
2	Department	Plans Preparation Manual
3	SBd. County	San Bernardino County Hydrology Manual
4	Department	Standard Special Provisions
5	Department	Standard Specifications
6	Department	Project Planning and Design Guide
7	Department	Construction Manual
8	Department	Design Information Bulletin No. 83-01
9	FHWA	Hydraulic Engineering Circular Number 21 (HEC 21)

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	District 8 Drainage Report Submittal Guidance Memo., dated July 1, 2010 (Exhibit 12-A)
Department	Exhibit 12-B, District 8 Drainage Report Format

Department	Ready –To-List and Construction Contract Award Guide (RTL Guide)
Department	Fish Passage Design for Road Crossings
SBd. County	San Bernardino County Flood Control District Standard Plans
SBd. County	San Bernardino County Design Standards
FHWA	Hydraulic Engineering Circulars (as listed in Caltrans Highway Design Manual)
FHWA	Hydraulic Design Series (as listed in Caltrans Highway Design Manual)

12.2.3 [NOT USED]

12.2.4 Software

The Design-Builder shall choose drainage design software from various drainage software packages listed in the *Caltrans Highway Design Manual* and those listed below to analyze and design all drainage systems:

- Civild and WSPGW Programs by Civil Design Corporation,
- AltPipe v. 6.08 – Web-based tool available at: <http://dap1.dot.ca.gov/design/altpipe/>,
- ONDRAIN v. 7.5c - Hydraulic Calculator for Onsite Drainage (English Units) by Caltrans Hydraulics,
- HEC-RAS 4.1 by US Army Corps of Engineers.

12.2.5 Data Collection

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, but not limited to, 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.
- The Design-Builder shall collect, identify, and mitigate all existing and proposed utilities that will pose potential conflict with all drainage systems within the project limits.

12.2.6 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 Design-Builder shall comply with and document the permit requirements, modifications, and contacts with the permitting agencies. Refer to Section 4.2.2 for all other permit requirements.

12.2.7 Training Qualifications and Certification

Design-Builder shall have a Hydraulic Engineer with at least 5 years of experience with drainage design for projects on the California State Highway System.

12.3 Design Requirements

All Drainage improvements must comply with, and be in accordance to, the standards and references listed in Section 12.2 and the following requirements:

- The Design-Builder shall maintain post-construction discharge rates at the current levels or at a rate approved by Caltrans and local agencies. The proposed design shall allow removal of runoff, effectively and efficiently, within the Right of Way (R/W) limits, without allowing additional discharge, greater than pre-construction rates, to flow onto private property and outside R/W limits.
- The Design shall provide a 50-year design life on all proposed drainage facilities within this project's limits, and shall address functionality, durability, ease of maintenance, wildlife crossings, safety, aesthetics, protection against vandalism, water quality, wetland impacts, and environmental compliance.
- The Design-Builder shall prepare hydrologic models and hydraulic design in accordance with Caltrans Highway Design Manual, provide engineering analysis to support effectiveness of design, allow Caltrans to review, and obtain Caltrans concurrence before proceeding with construction of any drainage facilities proposed on this project.
- The Design-Builder shall also be responsible for maintaining the level of condition at the time of NTP2 all culverts, siphons, conduits, and drainage systems within the project limits during the entire contract period. Such maintenance includes the removal and cleanup of any obstruction and blockage (debris, vegetation, sediments, chemicals, etc). The Design Builder shall repair culverts and replace any damaged inlets and outlets structures due to construction activities at no change or adjustment to the Contract Price or Contract Time.
- The Design-Builder shall prepare and submit Drainage Report for each location and/or phase of the project, for review and approval by Caltrans, during 60%, and 95% review cycles. The Final approved Drainage Report shall be submitted in both bound paper and electronic format. The drainage report shall be prepared using requirements outlined in Exhibit 12-A, District 8 Drainage Report Submittal Guidance Memorandum, dated July 1, 2010.
- For all paved areas the Design-Builder shall use five (5) minutes for time of concentration when calculating peak discharge.
- Concentration of sheet flow across roadways shall not be any more than 0.1 cubic feet per second, in particular at reversal points of super-elevated sections of the roadway.
- Provide scour protection to mitigate downstream erosion at all culvert outlets and stream crossings based on a case-by-case analysis to determine outlet velocities.
- Design scour and erosion control in accordance with the current Caltrans HDM.

- Avoid riparian habitat disturbances as much as possible during the design and construction of all new drainage outfalls. Situate the new outfalls so that the outlet elevation is as close to the existing grade as possible. Avoid high outlet elevations that will necessitate the use of excessive amounts of riprap. Use energy dissipaters as appropriate.
- Avoid any new outfall facilities located outside of the current environmental footprint. If outfalls will be outside the environmental footprint, obtain all required environmental and R/W clearances including permanent drainage easements.
- The Department has no standard plans for manholes, therefore, design, relocation, and construction of manholes for this project shall conform to APWA and/or the local agencies' adopted standards for manholes and other storm drain facilities within their right-of-way limits.

The Design Builder shall design all culverts, if necessary, to comply with the following requirements:

- The Design-Builder shall analyze the existing and proposed culverts and drainage ways impacted, replaced, or created by the Project design for any localized flooding problems. The Design-Builder shall design culvert replacements and improvements to meet the requirements of the Department's Highway Design Manual, local watershed management organization, and the affected cities' stormwater management criteria or master drainage plans,
- Use a minimum service life of 50-years for all new pipes and culverts,
- Evaluate each cross drain and document the type of end treatment selected. Provide either flared end section or head walls as appropriate,
- Determine the class of new pipe in accordance with the Caltrans HDM. Show the pipe size, material choice, thickness, bedding details, end sections, and other special details on the design Plans. Blind bends are not permitted. Bends and turns must occur within a cleanout or junction box,
- Design discharge systems to prevent scour of existing channels and embankments at the design flow rates in accordance with the current Caltrans HDM,
- All culverts' joints under roadways and ramps shall be watertight,
- Design culverts in accordance with the requirements in the current Caltrans HDM,
- Proposed Reinforced Concrete Pipe (RCP) culverts shall not be designed for any size less than 24 inches in diameter.

12.3.1 Surface Hydrology

12.3.1.1 Design Frequencies

The drainage design frequencies shall be as indicated by the *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 *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.

12.3.1.2 Hydrologic Methods

The Design-Builder shall perform hydrologic analysis and follow design methodology as prescribed by the *Caltrans Highway Design Manual* and San Bernardino County Hydrology Manual.

For design rainfall total amounts, the Design-Builder shall use the San Bernardino County Flood Control District's Hydrology Manual and the *Caltrans 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.

12.3.2 Hydraulic Structures

12.3.2.1 Storm Drains

12.3.2.1.1 Design Elements

The storm drain system design shall include these items:

- Drainage area maps for each storm drain inlet with pertinent data, such as boundaries of the drainage area, topographic contours, runoff coefficients, times of concentration, and land use with design curve number and/or design runoff coefficient.
- Location and tabulation of all existing and proposed pipe and drainage structures including all pipe and drainage structures proposed to be removed or abandoned. These will include size, class or gauge, catch basin spacing, detailed structure designs, and any special designs.
- Complete pipe profiles, including pipe size, type, and gradient; station offsets from the centerline of the roadway; gutter spread calculations, length of pipe; class/gauge of pipe; and numbered drainage structures with coordinate location and elevations.

The minimum longitudinal slope should be such that when flowing half full, a self cleaning velocity of 3 feet per second is attained.

12.3.2.2 Roadside Open Channels

The Design-Builder shall design roadside channels as specified in the *Caltrans Highway Design Manual*. The Design-Builder shall use equations from the *Caltrans Highway Design Manual* and HEC 15 to determine shear stress for designing and evaluating channel linings.

Create a surface ditch at the toe of all fill slopes so that all drainage is kept within the R/W. Grade these ditches to drain and use side slopes that permit vehicular passage.

12.3.3 Scour and Erosion Control

- Provide scour protection to mitigate downstream erosion at all culvert outlets and stream crossings based on a case-by-case analysis to determine outlet velocities.
- Design scour and erosion control in accordance with the current Caltrans HDM.
- Avoid riparian habitat disturbances as much as possible during the design and construction of all new drainage outfalls. Situate the new outfalls so that the outlet elevation is as close to the existing grade as possible. Avoid high outlet elevations that will necessitate the use of excessive amounts of riprap. Use energy dissipaters as appropriate.
- For all new outfalls located outside of the existing R/W obtain all required environmental and R/W clearances including permanent drainage easements.

12.3.4 Temporary Drainage Systems

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

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

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 water resources notes in the plans shall include a description of the drainage design for each stage of construction.

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

All drainage systems shall be operational at all times throughout construction. Installation of temporary drainage is required prior to modification, changes or removal of the existing drainage systems.

Storm sewer construction can occur by either open cut or trenchless methods as approved by the Department.

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 or residences impacted by these activities.

All surfaces impacted by construction shall be replaced in kind.

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 Released for Construction Documents (RFC)

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

- Hydrology Map with time of concentration (T_c), nodes, areas, curve numbers, runoff coefficients, etc.
- Drainage/ Layout plans,
- Drainage/System profiles including any utility conflicts,
- Drainage details including special designs and drainage structures, and any modified standard details,
- Drainage quantity sheets with reference to corresponding drainage systems and their elements,
- Drainage calculations and drainage models,
- Standard Specifications and Special Standard Provisions.

12.5.1.1 Drainage Layout Plans

- Provide drainage structure data (type, location, diameter, length, class tabulations) and details, roadway cross slope and superelevation, 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 superelevation, ponds, normal water line, high water line, and coordinate grid ticks and labels (minimum of three per sheet),

- Show dimensions for roadways and shoulders.

12.5.1.2 Drainage System 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.

12.5.1.3 Drainage Quantities

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

12.5.1.5 Specifications and Special Provisions

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

12.5.2 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.

12.5.3 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 Plans shall be signed by a licensed California Professional Engineer.

EXHIBITS

- Exhibit 12-A: District 8 Drainage Report Submittal Guidance Memo, dated July 1, 2010
- Exhibit 12-B: District 8 Drainage Report Format

These exhibits are provided as electronic files.

13 [NOT USED]

14 LANDSCAPE

14.1 General

The Design-Builder shall perform all Work necessary to meet the requirements for landscape, including erosion control, highway planting, irrigation systems and miscellaneous roadside treatments, preservation and protection of existing vegetative assets, weed control, hazardous tree control, plant establishment and worker and traveler safety. Miscellaneous roadside treatments include paving in areas beyond the gore and narrow areas, use of inert materials, treatment under guardrails, and other treatments to reduce manual maintenance activities and worker exposure to traffic.

The Design-Builder shall design and construct the landscape in accordance to the requirements of this specification, including performance requirements, standards and references, warranties, design and construction criteria, maintenance during construction, and required submittals.

14.2 Administrative Requirements

14.2.1 Standards

The Design-Builder shall design and construct the landscape elements 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 Design-Builder’s Submittal standard.

If there is any unresolved ambiguity in standards, obtain clarification from Department before proceeding with design 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.

Landscape Standards

Priority	Agency	Title
1	Department	Highway Design Manual (HDM)
2	Department	Standard Specifications
3	Department	Standard Special Provisions
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	The Plant Setback and Spacing Guide
9	Department	Final Environmental Document
10	Department	Technical Memoranda
11	Department	Landscape Architecture Program P.S.&E. Guide

14.2.2 References

Use the references listed below as supplementary guidelines for the design and construction of the landscaping and irrigation elements. These publications have no established order of precedence.

Landscape References

<i>Agency</i>	<i>Title</i>
Department	The California Native Wildflower Checklist and Native Plant Database
Department	The Water Conservation Deputy Directive (DD-13)
ISOA	International Society of Arboriculture Guide for Plant Appraisal
Department	Maintenance Manual Volume 1
AASHTO	A Guide for Transportation Landscape and Environmental Design
FHWA	Code of Federal Regulations, Title 23 (Highways), Chapter 1, Part 752 Landscape and Roadside Development
Department	Project Development Procedures Manual (PDPM)
Department	Construction Manual
California Department of Agriculture	California Noxious Weed Law, California Statutes and the current state list prohibited noxious weeds and restricted noxious weeds (“Noxious Plants of California”)
Department	Landscape Architecture Program website

14.2.3 Qualifications**14.2.3.1 Project Landscape Architect**

The Design-Builder shall assign a Landscape Architect licensed to practice in the State of California to perform or directly supervise the tasks required in this Landscape section.

14.2.4 [NOT USED]**14.2.5 Software**

The Design-Builder shall prepare all electronic drawings in MicroStation and supporting electronic data in CAiCE on the same version Department is using on the date of Final RFP.

14.2.6 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 landscape 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 meeting within five (5) days.

14.3 Design Requirements**14.3.1 Landscape Concept Meeting**

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

The Design-Builder shall use the meeting to determine the permanent landscape needs of the Project.

14.3.2 Requirements

Design and construct all landscape elements to meet the following performance requirements:

- At a minimum, erosion control treatment to disturbed slopes;
- Provide a natural, pleasing appearance without decreasing motorist safety;
- Use locally appropriate species of plant material;

- Is maintainable and prevents erosion;

14.3.3 Vegetation Preservation

The Design-Builder shall be responsible for preparing a report of the existing vegetation that shall consist of:

- Vegetation Inventory Plan including trees, shrubs, groundcovers, grasses and forbes
- Vegetation Preservation Plan
- Weed Control Plan

These plans shall be submitted for Department's Acceptance prior to commencing clearing and grubbing activities.

The Design-Builder shall prepare a Vegetation Preservation Plan indicating the construction limits and the proposed impacts on vegetative assets, including any impacts on vegetative assets outside of the construction limits. The location, quantity, condition, species importance, visual appeal and public acceptance of vegetation to be preserved and protected shall be documented on the plan for each protected area. The plan shall indicate the methods of vegetation preservation and protection to be used at each location indicated. The Design-Builder shall identify hazardous trees or portions of trees (those that are defective and have the potential to cause property damage or human injury) to be removed and record the locations of those trees on the Vegetation Preservation plan.

The Design-Builder shall identify and mark in the field the location and names of all existing trees, shrubs or groundcovers to be preserved and protected as environmental assets within the construction limits, as well as those outside of the construction limits, but within the Right of Way of the Project. Vegetation outside the Right of Way that may be impacted by construction activities shall also be identified. The Design-Builder shall maintain field markings and fencing to protect existing plant materials until Final Acceptance.

The Design-Builder shall salvage or utilize vegetation disturbed by construction in accordance with *Caltrans Standard Specifications*.

14.3.4 Weed Control

The Design-Builder shall identify and map areas of weeds, including noxious and invasive weeds, to be removed or controlled in accordance with the requirements established by Department, the California Department of Agriculture, and other local jurisdictions, including counties, municipalities and watersheds, and record the locations of these areas on a Weed Control Plan. The plan shall define methods used to control noxious weeds at each location. The Weed Control Plan shall be prepared by a California licensed Pest Control Advisor. Chemicals used to control weeds are restricted to those chemicals on the Department's approved list (see Exhibit 14-A).

While Department is not aware of any areas of biological controls within the project limits, the Design-Builder shall contact other local jurisdiction biological control coordinators to determine if any areas exist. If they do, the Design-Builder shall indicate areas of biological control on the Weed Control plan. The Design-Builder shall utilize methods of weed control that will not adversely impact Department's or other jurisdiction's biological control efforts.

The Design-Builder shall perform the following tasks to control weeds:

- Clean all earth-moving equipment and vehicles of dirt, mud, and seed residue before using it and bringing it onto the Project site. Certify that all equipment has been cleaned using high-pressure water blasting or steam-cleaning methods;
- Clear the Project work area of weeds before disturbing soil. Eradicate weeds with selective herbicides recommended for those weed species;

- Minimize soil disturbance outside the slope stake limits. Monitor and control any disturbed area from weed invasion, and revegetate the disturbed areas; and
- Monitor gravel, rock, borrow, and imported topsoil being used on the Project for weeds and control weed growth with post-emergent herbicides.

After planting, eradicate all weeds within the ROW by use of pre-emergent, selective, and nonselective herbicides. Monitor erosion control practices to prevent weed invasion in disturbed areas. If using chemical weed control, it must be applied in accordance with the weed control plan by a Qualified Applicator licensed by the California Department of Pesticide Regulations. Ensure that the product will not damage or kill the surrounding desirable plant material. If necessary, use hand pulling to eliminate weeds in these areas.

14.3.4.1 Roadside Clearing

Prior to preparing planting areas and erosion control seeding areas or commencing irrigation trenching operations for planting areas, trash and debris shall be removed from these areas.

After the initial roadside clearing is complete, additional roadside clearing work shall be performed as necessary to maintain the areas, as specified above, in a neat appearance until the start of the plant establishment period. This work shall include the following:

- A. Trash and debris shall be removed,
- B. Rodents shall be controlled,
- C. Weed growth shall be killed before the weeds reach the seed stage of growth or exceed 6" in length whichever occurs first

14.3.5 Erosion Control

The Design-Builder shall design temporary and permanent erosion and sediment control methods complying with all applicable laws including the Clean Water Act General Construction Permit and the Caltrans NPDES Permit in a manner that will not prohibit or compromise the installation, effectiveness, health, or design intent of vegetation.

The Design-Builder shall re-establish to original condition or better areas within temporary construction easements. Provide grading; strip, stockpile and reapply all topsoil and duff; and provide plant material as needed. Obtain property owner approval on the final condition of the site. The contractor shall treat all disturbed slopes immediately after construction to reduce erosion.

14.4 Construction Requirements

Construction shall be in accordance with the requirements of the standard specifications and the special provisions.

14.4.1 Vegetation Preservation

The Design-Builder shall limit the area of disturbed soil at any given time, subject to approval of the Department, to 5 acres.

The Design-Builder shall place temporary fencing according to Caltrans Standard Specifications and Special Provisions at Environmentally Sensitive Areas to protect any plants or plant areas designated to be preserved and protected in the Vegetation Preservation plan. The Design-Builder shall remove the fencing when the Project has reached Final Acceptance.

The Design-Builder shall remove hazard trees or remove portions of those trees that are hazardous using methods that prevent damage or injury to nearby vegetative assets and in compliance with Standard Specifications and Special Provisions.

The Design-Builder shall replace at a ratio of 5:1 all naturally existing native trees affected by the project that have a 4-inch diameter at a height of 4.5 feet above grade. Tree replacement shall be coordinated with Department. Native trees shall be replaced in accordance to District Landscape Architecture policies.

The Design-Builder shall maintain existing and new landscape elements during construction in accordance with the requirements in the Technical Provisions, Maintenance during Construction.

14.4.2 Existing Irrigation Facilities

Clearing, grubbing, and earthwork operations shall not be performed in areas where existing irrigation facilities are to remain in place until existing irrigation facilities have been checked for proper operation in conformance with the provisions in "Existing Highway Irrigation Facilities" of the standard specifications.

14.4.3 Weed Control

The Design-Builder shall remove weeds or treat areas designated for weed control to eliminate weeds. Map locations indicating areas of weed control shall be maintained throughout the Project.

The Design-Builder shall keep pesticide (herbicide) application records as well as provide all project pesticide application records to Department.

14.4.4 Plant Establishment

The Design-Builder shall follow 'Plant Establishment' as defined in *Caltrans Standards Specifications* and Standard Special Provisions.

14.5 Deliverables

14.5.1 Landscape Concept Plan

The Landscape Concept Plan shall include erosion control, and miscellaneous roadside treatments and shall be submitted to Department for Approval within 60 Working Days after the landscape concept meeting. Landscape shall conform to Department standards and comply in concept with the Water Resources Department's draft model water ordinance (No. 1986#).

14.5.2 Vegetation and Landscape Plans

The Design-Builder shall prepare and submit to Department, a Vegetation Preservation plan, Vegetation Inventory Plan, Vegetation Protection and Removal Plan, and Weed Control plan.. These plans shall be submitted for Department's Acceptance prior to starting construction activities. The landscape plans shall be prepared in conformance with the *Caltrans Plans Preparation Manual* and *Caltrans Landscape Architecture P.S.&E. Guide*.

14.5.3 As-Built Documents

Upon completion of the Project, the Design-Builder shall deliver to 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.

The Design-Builder shall provide as-built plans for landscape. The plans shall include layouts, cross sections, details, and summary of quantities. The plans shall be prepared in conformance with the *Caltrans Plans Preparation Manual* and *Caltrans Landscape Architecture P.S.&E. Guide*.

The Design-Builder shall provide final calculations and design reports signed by a licensed Landscape Architect for all design elements used under this section.

14.5.3.1 Final Design Documents

The Design-Builder shall submit final landscape documents to Department when final landscape work is complete, including office and field generated design changes. Final design documents include, but not limited to:

- Plans
- Reports/Project documentation
- Specifications and Special Provisions

A copy of the final irrigation plans are to be laminated and placed in each irrigation controller enclosure.

14.5.3.2 Over-the-Shoulder Design Documents

During the landscape design process, any submittals required in the Design Standards or other Contract Documents shall be prepared by the Design-Builder and submitted to Department. Submittals shall be in a format acceptable to Department and organized to facilitate review by Department.

14.5.3.3 Released for Construction Documents

The Design-Builder shall produce plans and specifications in a format that aids and facilitates design review by Department, 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 Plan Preparation Manual*, and the Design Quality Management Plan before construction may begin. Department Approval for Landscape RFC plans is required.

14.5.3.4 Non- Standard Specifications and Non-Standard 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

Exhibit 14-A Pesticides

This document is provided as an electronic file.

15 [NOT USED]

16 SIGNING, PAVEMENT MARKING, AND LIGHTING

16.1 General

The Design-Builder shall perform all Work necessary to meet the requirements for permanent and temporary signing, permanent and temporary pavement marking, and permanent and temporary 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, 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 Proposal issue date unless specified herein or 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 2012)
2.	Department	Highway Design Manual
3.	Department	Special Provisions
4.	Department	Standard Plans
5.	Department	Design-Build Modifications to the Standard Specifications
6.	Department	Standard Specifications
7.	Department	Sign Specifications
8.		Various Technical Memoranda
9.	AASHTO	A Policy on Geometric Design of Highways and Streets
10.	AASHTO	Standard Specifications for Structural Support for Highway Signs, Luminaires, and Traffic Signals, 4 th Edition with 2002, 2003, and 2006 Interims
11.	Department	Plans Preparation Manual
12.	Department	CADD Users Manual

Remaining Standards set forth in book 3

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 | Standard Plans |
| 5 | Department | Design-Build Modifications to the Standard Specifications |
| 6 | Department | Standard Specifications |
| 7. | Department | Sign Specifications |
| 8. | Various | Technical Memoranda |
| 9. | AASHTO | A Policy on Geometric Design of Highways and Streets |
| 10. | AASHTO | Roadside Design Guide |
| 11. | Department | Plans Preparation Manual |
| 12. | Department | CADD Users Manual |
| 13. | Department | Remaining Standards set forth in Book 3 |

16.2.1.4 [NOT USED]

16.2.1.5 Permanent Lighting Standards

Priority	Agency	Title
1.	Department	Traffic Manual Chapter 9 Lighting
2.	Department	Roadway Lighting Design Manual
3.	Department	CADD Data Standards (Lighting Cell Library)
4.	Department	Signal and Lighting Guidelines
5.	Department	Special Provisions
6.	Department	Standard Plans
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

Remaining Standards set forth in book 3

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
AASHTO	Roadside Design Guide

16.2.3 [NOT USED]

16.2.4 Preliminary Engineering Documents

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 as the drafting and design software.

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

16.2.6 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 Signing, Lighting, and Pavement Marking Work during the design and construction stages. The requesting entity shall provide the other parties with not less than five (5) Working Days prior notice of such meetings. The Design-Builder shall prepare and distribute within five (5) Working 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 [NOT USED]

16.2.8 Certification Requirements

Design-Builder shall have an Electrical Engineer or a registered Civil Engineer with a minimum of 5 years electrical design experience on the California State Highway System.

16.3 Design Requirements

16.3.1 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 regulatory, 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 all, signs on overhead sign structures.

The Design-Builder shall supply all sign panels..

16.3.1.1 Signing Concept Meetings

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:

- Continue to display such signing during the remaining construction of the Project if permanent signing is erected by the Design-Builder that could be used for motorist guidance
- 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.
- Upgrade the existing signs within the limits of the project per the following procedure. The sign panels to be upgraded are shown but not limited in Exhibit 16-E
 - Design Builder will perform inventory and analysis to confirm if signs meet the current MUTCD.
 - All existing sign panels will be tested for reflectivity.
 - All sign posts and panels that do not meet the current MUTCD requirements shall be replaced.
 - Overhead signs and bridge mounted signs, including Changeable Message Sign Boards will not be structurally upgraded per this project. The panels may require replacement,
- The Signing plan shall provide for modifications to signage within the project work limits that are rendered inaccurate, ineffective, confusing, obsolete, or unnecessary by the Project. This includes guide signs on roadways within the project work limits. Guide signs include route marker assemblies, directional, distance, and information signs. The modifications shall include the addition, removal, or alteration of signs and appurtenances as deemed necessary by the project,

- 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 2012 standards,
- 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,

16.3.1.3 Material Requirements

Traffic signs shall be constructed in accordance with the provisions of *Caltrans Standard Specifications* and *Caltrans 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 *Caltrans Standard Plans* and *Caltrans 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, and premium anti-graffiti film. (see Exhibit 16-D for retro-reflectivity chart),
- 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 Department requirements Contractor shall verify the exit numbers via the Calnexus web site, WWW.dot.ca.gov/hq/traffops/signtech/calnexus/index.htm,
- Shall be verified for correct legend and distances,
- 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

- Remove and dispose all existing sign structures when no longer needed. No existing overhead sign structures may be relocated/reused within the project,

Overhead sign structures to be replaced shall maintain existing clearance if higher than the specified clearance for new overhead sign structures.

16.3.1.6. Roadside 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.

16.3.1.7. [NOT USED]

16.3.1.8 Lettering Height

- Sign visibility and legibility shall be as per the CA MUTCD,
- Space guide signs apart as per the CA MUTCD,
- Interchange exit number panel width: Shall be per the CAMUTCD. The smaller width tabs that are justified for exit numbers shall be used. 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 Department Standards,

16.3.1.-9 Other Signage Requirements

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

Signs on bridges require the review and approval of Special Projects described on New Overhead Sign Structures.

Bridge number and location (G-11's) signs must be provided for every bridge location.

16.3.2 Pavement Delineation

Pavement delineation Work shall include designing, installing, modifying, or removing striping and pavement markings. All pavement delineation shall conform to the CA MUTCD, *Caltrans Standard Plans* and *Standard Specifications*. The Design-Builder shall prepare pavement delineation plans that show edge striping, lane line striping with black shadow stripe and pavement markings consistent with the needs of the project. The Design-Builder shall design all temporary pavement delineation to comply with The CA MUTCD and Caltrans Standard Specifications and Special Provisions for temporary pavement 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, recessed 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 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 CA MUTCD and *Caltrans 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, *Caltrans Standard Plans* and *Standard Specifications*.

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

Freeway lane lines shall be a combination of a thermoplastic traffic stripe and retro-reflective recessed pavement markers.

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 [NOT USED]

16.3.7 *Permanent Lighting*

Design, furnish and construct all components of a roadway lighting system necessary to current standards 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 off-ramp gore areas, under structures.

Electrical Work shall include designing, furnishing, installing, modifying, maintaining, during construction relocating, or removing of ITS elements, 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,
- 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,

The Design-Builder shall consider, but is not 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 luminaires being used to light the roadways).

16.3.7.3 [NOT USED]**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

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 temporary 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 electroliers 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 [NOT USED]**16.3.7.8 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. The photo electric control for the sign shall be at the service and a test switch shall be provided at each sign.

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,
- Each signal will be provided with a dual meter service (Type IICF). One meter will be connected to the signal and the other will be connected to the safety lighting.

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

- Traffic monitoring stations,
- CCTV,

- Photoelectric controls,
- Freeway lighting and sign lighting shall be on the same meter, irrigation shall be on a separate meter.

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.

Fabrication of welded steel for overhead sign structures, and welded steel poles for lighting and signal structures shall be manufactured at a facility audited and approved by the Department. For a current listing of fabricators that have successfully completed the Department's facility audit refer to:

http://www.dot.ca.gov/hq/esc/Translab/OSM/smdocuments/Internet_auditlisting.pdf

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.

16.4.2 Permanent Pavement Marking

All pavement markings, permanent or temporary, where no longer required for traffic demarcation shall be completely removed.

16.4.3 [NOT USED]

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. All new service cabinets shall have their CT ID numbers and addresses shown on the plans.

16.4.4 [NOT USED]

16.4.4.1 Salvage

No electrical equipment shall be salvaged for reuse. All material to be removed shall become the property of the Design-Builder and shall be removed from the freeway right of way in conformance with the Standard Specifications. .

16.4.4.2 Lighting

The Design-Builder shall provide maintenance for permanent or temporary lighting installations within the project limits until Substantial Completion of the Project.

16.5 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 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.

16.5.2 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.

16.5.3 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 *Caltrans CADD Standards*, *Caltrans 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. The 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

The Design-Builder shall request the Department 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. Approval of such request is the sole discretion of the Department.

EXHIBITS

Exhibit 16-A:	Special Design Submittal Form
Exhibit 16-B:	Special Design Submittal Guidelines
Exhibit 16-C:	Pull box Details.
Exhibit 16-D:	Sign Retro-reflectivity Chart.
Exhibit 16-E:	Pictures of Existing Sign Panels to be Replaced

These exhibits are provided as electronic files.

17 INTELLIGENT TRANSPORTATION SYSTEMS (ITS)

17.1 General

The Design-Builder shall perform 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 scope of ITS Work shall include system planning, design, furnishing, installation, modifying, integration, testing, interim maintenance, and system acceptance of ITS to maintain the existing level of service

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 Request for Proposals issue date unless specified herein or modified by Addendum or Change Order.

Intelligent Transportation Systems Standards and Requirements

Priority	Agency	Title
1.	Department	California Manual on Uniform Traffic Control Devices (CA MUTCD 2012)
2.	Department	Traffic Manual
3.	Department	District Electrical Details
4.	Department	Standard Plans
5.	Department	Standard Specifications
6.	Department	Highway Design Manual
7.	Department	Construction Manual
8.	Department	Technical Memoranda
9.	Department	Plans Preparation Manual
10.	Department	Ramp Metering Design Guide
11.	Department	Fiber Optic System Design Guide

Remaining Standards in Book 3..

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
USDOT	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
AASHTO	Roadside Design Guide

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.

17.2.3 [NOT USED]***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 recent MicroStation Version 8 and CAiCE Version 10SP8 as the drafting and design software, respectively

Design-Builder shall use ITS devices that are compatible with the data requirements of the Caltrans District 8 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 Department 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 have an Electrical Engineer or a registered Civil Engineer with a minimum of 5 years electrical design experience on the California State Highway System.

The Design-Builder shall coordinate with the METS lab to coordinate the inspection of Electrical equipment and all pole standards.

17.2.7 Department Responsibilities

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 and conductors,
 - Insulation characteristics of power and signal control cables and conductors,
 - 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;
- And be present when the following ITS component existing locations are staked or flagged:
 - F/O cable,
 - Splice vaults,
 - Pull boxes,
 - CCTV Cameras and poles,
 - Wireless Vehicle Detection Stations (WVDS)
 - Weather Stations
 - Cabinets.
 - Any other ITS associated systems.

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 existing TOS system during construction,
- Fiber-optic cable/conduit location,
- Fiber-optic cable/conduit location,

-
- Splice vault /Pull box locations,
 - Cabinet locations,
 - Fiber-optic cable splicing and testing,
 - Locating ITS elements (ramp metering systems, traffic monitoring stations/count stations, CCTV cameras, and Maintenance Vehicle Pullouts (MVPs),
 - Salvaged items,
 - Worker certifications,
 - Component testing (wire tests, loop detector and piezo-electric axle sensors testing),
 - Test equipment calibration,
 - Documentation of 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,
 - Upgrade existing Roadway Weather Information System (RWIS).

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 fiber-optic communications, real-time National Television System Committee (NTSC) closed circuit television (CCTV) surveillance, operations data collection (loop detection and piezo-electric axle sensors), 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 recovery 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 recovery zone, they shall be constructed and protected per AASHTO Roadside Design Guide, Caltrans HDM and Caltrans Standard Plans,

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 District 8 Transportation Management Center (TMC)

District 8 TMC's primary purpose is to integrate Department's District Maintenance Dispatch and 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. District 8 TMC serves as a central point for collecting, verifying, processing, and distributing real-time transportation information throughout the Project area. Information will be collected using various ITS components, including such roadside devices as closed circuit television cameras, ramp metering systems and traffic monitoring stations/count stations.

The data signals received at District 8 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, traffic monitoring station (count stations), or ramp metering on the corridor and without affecting the existing system.

17.3.3 Permanent Traffic Control

17.3.3.1 Reserved

17.3.3.2 Traffic Monitoring Stations(TMS)

The Design-Builder shall replace traffic monitoring stations/count stations and vehicle classification for measuring, at a minimum, vehicular volume and lane occupancy and type of vehicle on the freeway. The Design-Builder shall place permanent loop detection and piezo-electric axle sensors in, auxiliary and mainline lanes. The Design-Builder shall not have more than 22 detector inputs per cabinet. Locations unaffected by construction do not require new loop detectors and piezo-electric axle sensors. The Design-Builder shall furnish and install necessary equipment for all TMS/CS's to make the system fully operational. Existing TMS shall be upgraded to meet current specifications. The Design Builder is responsible for maintaining continuous and uninterrupted service from the site to all external communication networks.

The Design-Builder shall relocate and modify the existing Wireless Vehicle Detection Stations (WVDS). Existing wireless magnetometers shall be removed from the effected pavement before work begins and installed in the new pavement after work has been completed. The Design-Builder must ensure that the WVDS operates as it did before construction began. Any configuration changes must be updated in the controller (Access Point).

17.3.4 Weather Stations

The Design-Builder shall replace surface and sub-surface temperature sensors located within or beneath the effected pavement. A new controller (Data logger or Remote Processing Unit) must be installed at all weather station locations. The controller must be configured to accept data from all connected external sensing devices, and communicate with the central weather server. Any environmental sensors that do not

integrate properly with the new controller must be replaced. Testing will include the display of sensor data on the central weather station server.

17.3.5 [NOT USED]

17.3.6 [NOT USED]

17.3.7 Grounding

17.3.7.1 [NOT USED]

17.3.7.2 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 completing and submitting the application for electrical service and all costs associated with utility hook-up charges and components installed by the utility company. All pull boxes containing power shall be tamper proof lockable boxes as shown on Exhibit 16-C (refer to Section 16, Book 2of the RFP)

17.3.7.3 Coordination with Power Utility

The Design Builder shall coordinate with the Utility for request to shut off or turn on service during construction period if needed and inform the Department when power service is interrupted. The Design Builder shall be responsible for obtaining new or modified electrical service points, including all applications and permits required from the serving utility company. Conductors for service and load shall not be in the same conduit. 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. A 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 (TMS, RMS, EMS, 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,.
- Piezo-electric axle sensors
- Pull boxes,
- Control cabinets,
- CCTV Camera poles,
- Wireless Vehicle Detection Stations

- Weather Stations

The Design Builder shall 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 will 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 except for sensors embedded in the pavement. These sensors can be taken out of commission for a total of 14 days. 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 while working on the existing system. A 24 hour 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 Loop Detectors and Piezo-Electric Axle Sensors for TMS/CS

Exact locations for all TMS/CS stations shall be determined in the final design phase of the Project.

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..

Testing and Setting Up the Piezo Electric Axle Sensor Installation The Design Builder shall set up the detector card. The Design Builder shall be responsible for notifying when the Piezo Electric Axle Sensor and the screened transmission cable are ready for termination and testing.

Terminating screened transmission cable in the Cabinet The screened transmission cable shall be terminated in the controller cabinet. The Design Builder will terminate the screened transmission cable.

17.4.4 Coaxial Cable

The Design Builder shall not use coaxial cable, other than for CCTV installations between the camera and the cabinet, and within the hub.

17.4.5 [NOT USED]

17.4.6. Splice Vault and Communication Pull Box

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.

Provide sheath grounding units for all fiber-optic cable ground locations (cabinets, shelters, and splice vaults). In the fiber-optic splice vault, only one sheath grounding unit is needed between the splice enclosure and the ground rod. When used in control cabinets, fiber patching shelters, and ITS shelters, a sheath-grounding unit is used on each fiber-optic cable entering/exiting the cabinet/shelter. The sheath grounding unit shall:

- Connect to the cable armor,
- Provide a low impedance ground path for high voltage transients while allowing location and monitoring signals to pass,
- Provide test access to the armor,
- Automatically reset,
- Have a failsafe circuitry design,
- Have a hybrid surge suppression circuitry,
- Be designed for below grade use, and
- Have a No. 6 AWG stranded copper lead wires.

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 15 feet long, one piece, and comply with Caltrans Standard Specification. 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 Existing Conduit Systems

Existing conduit systems may consist of PVC, polyethylene, continuous polyethylene, or RSC. When installing fiber-optic cable assemblies in existing conduits through existing pull boxes, the Design Builder shall check the cable route to ensure that there is a smooth transition between exit and entrance elevations and that the horizontal angle is not so sharp as to cause damage to the cable as it is being pulled through the existing conduit. If the Design Builder encounters sharp bends, the Design Builder shall reinstall conduit to provide a smooth transition. The Design Builder shall clean the existing conduit of any debris that could impede pulling fiber-optic or copper cable through it or that could damage the cable if the debris remained.

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.

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 *Caltrans CADD Standards*, *Caltrans 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 Detector assembly, Piezo-electric axle sensor, loop detector lead-in cable, screened transmission cable, 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 and piezo-electric axle sensor test report within one week after completing installation for loops and piezo-electric axle sensor. 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.

17.5.2 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)

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.

If the Design Builder requests approval for 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 Design-Builder shall also provide justifications for the use of NSSPs. The NSSP approval process for ITS NSSPs requires a minimum of four weeks for review and approval notwithstanding review and approval by the Department. Approval of NSSPs is at the sole discretion of the Department.

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 standards.

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 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 (MUTCD)
4	Department	Standard Special Provisions
5	Department	2010 Revised and New Standard Plans
6	Department	Standard Plans 2010
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	Traffic Manual, Chapter 7
12	Department	CADD User Manual
13	AASHTO	A Policy on Geometric Design of Highways and Streets,
14	AASHTO	Roadside Design Guide, 4 th Edition

*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
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 Maintenance Of Traffic (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.
- The TMP shall minimize project related traffic delays and potential accidents by the effective application of traditional traffic mitigation strategies and an innovative combination of public and motorist information, demand management, incident management, system management, alternate route strategies, construction strategies, or other strategies,
- 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.
- The Transportation Management Plan must be submitted for review at least 60 days prior to any construction, and must be approved before issuance of NTP2,
- No lane closure, on either the mainline or ramps will be allowed prior to approval of the TMP.

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, 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 incorporate the Lane Closure Charts provided by the Department (see Exhibit 18-A). Any revisions to the Lane Closure Charts provided, or additional Lane Closures Charts required, shall be submitted to the Department for approval using the form provided in Exhibit 18-B. The Department will have 5 Working Days to review the request.

The existing number of lanes must remain open to traffic unless allowed by an approved lane closure chart.

No more than 2 weekend closures will be allowed in any given month. No more than 12 weekend closures will be allowed for entire project.

The Design Builder shall maintain one eight-foot outside shoulder on I-15 for southbound direction of travel for entire length and duration of project, unless otherwise altered for specific conditions in this RFP.

The Design Builder shall maintain one eight-foot shoulder on I-15 for northbound direction of travel from PM 23.0 to northerly project limit (PM R28.5).

Only one work location will be allowed in one direction of travel when the number of existing lanes are reduced as allowed per approved lane closure chart.

For the northbound direction of travel on I-15 from the southerly project limit (PM 15.4) to PM 23.0 the Design Builder will be limited to a total of 3.5 miles of outside shoulder width reduction. The shoulder width reduction must still maintain 1 feet minimum width. Vehicle Pull-Outs of length 1,000 linear feet with 8' width at the outside shoulder will be at least spaced at 1.75 miles or less.

At no time may an outside shoulder or an inside shoulder be less than 1 feet in width.

At locations where existing mainline outside shoulders are less than 8' in width the Design Builder may temporarily reduce shoulder width to 1'(Bridge locations, etc.),

From Post Mile 29.0 to 30.8 for both the northbound and southbound directions the contractor shall schedule their work to be the last order of work or not commence until project EA 08-341604 (EFIS Number 08000006134) has completed all work that impacts the I-15 freeway.

Requests for revisions or additional Lane Requirement Charts shall include:

- Delay calculations (The Department will verify delay calculations using Department's calculation sheets, which can be provided upon request),,
- The purpose of requests,
- Per lane capacity for work zone,
- Field traffic counts,
- Detour plans (if necessary).

Major closure (closures exceeding 30 minutes delay as verified by the Department) will require a major lane closure approval process. The Department will have 20 Working Days to review the request.

Major Lane Closure Approval Process requirements:

- Location and Vicinity maps showing the State Highway(s), local street network, and other adjacent lane closures or nearby work that may affect traffic during the same period. Including special events,
- Dates, times and locations of the lane closure(s),
- Description of the work being performed during the lane closure(s),
- Description of each lane closure and its anticipated affect on traffic,
- Amount of expected delay and corresponding queue length for each lane closure,
- Summary of TMP strategies that will be used to reduce delay and motorist inconvenience during the lane closure(s). A copy of the TMP,
- Contingency plan,
- Radio and newspaper advertising (See Book 2, Section 3),
- Proposed PCMS messages (See Book 2, Section 18.4.6.4)..

Approval of additional lane closures and/or Major Lane Closures is solely at the discretion of the Department.

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.

18.3.1.1 COZEEP

The Design Builder may request for California Highway Patrol (CHP) officers in critical lane closures through the Construction Zone Enhanced Enforcement Program (COZEEP). Such service is at the discretion of the Department and CHP and does not relieve the Design Builder from the responsibilities specified in Section 7-1.09, “Public Safety”, and Section 12, “Construction Area Traffic Control Devices”, of the Caltrans Standard Specifications. The request shall be submitted a minimum of seven days in advance. The Design Builder shall be responsible for any cost accrued for CHP services not utilized as scheduled. Cost includes cancellations or changes done within 48 hours from the scheduled time of service.

18.3.1.2 Freeway Service Patrol (FSP)

Freeway Service Patrol is a service that involves the use of dedicated near-site towing services in coordination with the CHP (separate from COZEEP) to reduce the time required to remove disabled vehicles from the roadway.

FSP shall be provided during the hours listed in Table 18.1 when the width of both inside and/or outside mainline shoulders are reduced to less than eight feet for a continuous distance of more than 500 feet. For Major Closures, FSP shall be provided for the entire duration of the closure. The Design Builder shall submit to the Department FSP work schedules a minimum of seven working days in advance of a closure.

Table 18.1

DAY OF WEEK	WINDOW WHEN FSP IS REQUIRED
MONDAY TO THURSDAY	5:30AM TO 9:30AM AND 3:00PM TO 8:00PM
FRIDAY	5:30AM TO 9:30AM 1:00PM TO 9:00PM
SATURDAY	11:00AM TO 5:00PM
SUNDAY	12:00PM TO 8:00PM

Payment for FSP shall be made by the Department to the FSP provider and deducted from the Design Builder’s monthly progress payment at a rate of \$170 per every hour FSP is provided.)

Cancellation of FSP service must be made between 8:00 a.m. to 3:00 p.m. Monday through Friday, excluding holidays. Deduction from the Design Builder’s monthly progress payment will be made for actual costs per Table 18.2 for FSP services cancelled.

Table 18.2

CANCELLATION	RECEIPT OF NOTICE OF CANCELLATION	CHARGE
Tow Operator	Less than 24 hours before arrival on the assigned FSP beat ¹	\$156
	After arrival on the assigned FSP beat ¹	\$416
CHP	Within 24 hours of scheduled FSP service	\$472

¹ The territory and time of patrol.

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 Department and the appropriate governing agency to close or modify the pedestrian access and shall furnish and install proper signing for pedestrians.

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 will be allowed for the northbound direction of traffic to shift to the south bound roadbed from the southerly project limit (PM 15.4) to approximately post mile 22.0. The cross over shall be designed and constructed for single lane, in accordance with the following criteria Minimum design speed: 50 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 [NOT USED]

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 function 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 the MUTCD and 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 closure charts provided by the Department (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 3.0 mile.

No more than one (1) separate stationary lane closures will be allowed in any one direction of travel at any given 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.

All ramps for all interchanges, brake inspection area, truck escape ramp and truck scales will not be allowed to be closed during construction.

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	xxx						
	SD xx									
x	xx	H xx	xx	xxx						
		SD xx								
	x	xx	H xx	xx						
			SD xx	xxx						
	x	xx	xx	H xx	xxx					
	x	xx	xx	SD xx	xxx					
				x	H xx	xxx				
				x	SD xx					
					x	H xx	xxx			
						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

District 8 Special Events List

No work that encroaches onto the traveled way of the affected Routes shall be allowed from 3 hours before to 2 hours following special events listed below unless otherwise permitted by the District Traffic Manager

Venue/Special Events	Affected Routes	Route Impact	Route Limits	Presently Identified The Month Of Events	Website	Contact #
San Manuel Amphitheater (Glen Helen)	215 15	*** **	University Pkwy to I-15/215 Connector I-60 to Devore Road	Various events May-Oct yearly See web site	www.sanmanuelamphitheater.com/	909-880-6500
Route 66 Rendezvous	215	***	Mill St. to 5 th St	September	www.route-66.org	909-889-3980
Auto Club Speedway (California)	10 15 210 66 60	*** *** *** *** ***	LA I-57 to SBD I-215 I-15/215 to SR-91 Haven to I-215 Haven to Cherry I-15 to County Line	Various events Thru the year See web site	www.autoclubspeedway.com/	909-429-5000
Temecula Balloon and Wine Festival	15	**	SR-79 (Winchester Rd) and Rancho California	June	www.tvbwf.com	951-676-6713
Bob Hope/Chrysler Classic	10	**	Palm Springs off ramp at SR-111	January	www.bhcc.com	760-346-6329
Kraft Nabisco Championship	10	**	Palm Springs off ramp at SR-111	March	http://www.knccgolf.com/	760-324-4546
Festival of Lights (Downtown Riverside)	91	**	I-15 to I-215/SR-60 split	November	http://www.riversidedowntown.org/	951-683-7100
March Air Show March Air Reserve Base	215	***	Cactus to Ramona Express Way	May	http://www.marchfieldairfest.com/	951-655-1110
UCR Graduation	60 215	*** ***	I-215/SR-60/SR-91 split to Central Ave	June	www commencement.ucr.edu	951-787-3144
Laughlin River Run	40	***	I-40/ From I-15 to Arizona State Line	April	http://www.laughlinriverrun.com/	949-502-3434
Thunder & Lightning Powwow	10	***	I-10/ Morongo Valley	September	http://www.morongocasinoresort.com/pow2.cfm	800-252-4499 ext.# 23800

Note: The dates of events change yearly. Contact numbers and websites provided to verify exact dates.

- ** Designates-Moderate Impact (20 minute delay or less)
- *** Designates-High Impact (30 minute delay or less)
- **** Other special events do exist that impact our freeway and highway system. Close coordination with the
 Local agencies and other impacted entities must be carried out before conducting work that requires
 Full or partial closures.

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 dates 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 and will not be subject to the \$300 fine.

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 Late Reopening Of Closures

If a closure is not reopened to public traffic by the specified time, work shall be suspended in conformance with the provisions in Section 8-1.05, "Temporary Suspension of Work," of the Standard Specifications. No further closures are to be made until the Department has accepted a work plan, submitted by the Design-Builder that will ensure that future closures will be reopened to public traffic at the specified time. The Department will have 2 business days to accept or reject the Design-Builder's proposed work plan. The Design-Builder will not be entitled to compensation for the suspension of work resulting from the late reopening of closures.

For each 10-minute interval, or fraction thereof past the time specified to reopen the closure, the Department will deduct the amount per interval shown below from moneys due or that may become due the Design-Builder under the contract. Damages are limited to 5 percent of project cost per occurrence and will not be assessed when the Department requests that the closure remain in place beyond the scheduled pickup time.

Type of facility	Route or segment	Period	Damages/interval (\$)
Mainline	SBd 15 NB PM R15.2/30.8	1st half hour	\$1,150 / 10 minutes
		2nd half hour	\$1,725 / 10 minutes
		2nd hour and beyond	\$2,300 / 10 minutes
Mainline	SBd 15 SB PM R15.2/30.8	1st half hour	\$1,750 / 10 minutes
		2nd half hour	\$2,625 / 10 minutes
		2nd hour and beyond	\$3,500 / 10 minutes

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 MUTCD, 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 Moving Lane Closure

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

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

1. Hexfoam TMA Series 3000, Alpha 1000 TMA Series 1000, and Alpha 2001 TMA Series 2001, manufactured by Energy Absorption Systems, Inc., 35 East Wacker Drive, Suite 1100, Chicago, IL 60601:
 - 1.1. Northern California: Traffic Control Service, Inc., 8585 Thys Court, Sacramento, CA 95828, telephone (800) 884-8274, FAX (916) 387-9734
 - 1.2. Southern California: Traffic Control Service, Inc., 1818 E. Orangethorpe, Fullerton, CA 92831-5324, telephone (800) 222-8274, FAX (714) 526-9501
2. Cal T-001 Model 2 or Model 3, manufacturer and distributor: Hexcel Corporation, 11711 Dublin Boulevard, P.O. Box 2312, Dublin, CA 94568, telephone (925) 551-4900
3. Renco Rengard Model Nos. CAM 8-815 and RAM 8-815, manufacturer and distributor: Renco Inc., 1582 Pflugerville Loop Road, P.O. Box 730, Pflugerville, TX 78660-0730, telephone (800) 654-8182

Each TMA shall be individually identified with the manufacturer's name, address, TMA model number, and a specific serial number. The names and numbers shall each be a minimum 1/2 inch high and located on the left (street) side at the lower front corner. The TMA shall have a message next to the name and model number in 1/2 inch high letters which states, "The bottom of this TMA shall be _____ inches \pm _____ inch above the ground at all points for proper impact performance." Any TMA which is damaged or appears to be in poor condition shall not be used unless recertified by the manufacturer. The Department shall be the sole judge as to whether used TMAs supplied under this contract need recertification. Each unit shall be certified by the manufacturer to meet the requirements for TMA in conformance with the standards established by the Transportation Laboratory.

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

New TMAs proposed as equal to approved TMAs or approved TMAs determined by the Department to need recertification shall not be used until approved or recertified by the Transportation Laboratory.

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.

18.4.6.4 Use During Major Closures

Portable changeable message signs (PCMS) shall be utilized according to the requirements of this Section 18.4.6.4 for all major lane closures of mainline freeway (as defined in Section 18.3.1 above). For such closures, PCMS shall be placed at the following locations shown in Table 18.3. Exact locations shall be approved by the Department prior to use.

Table 18.3

Location	Minimum Number of PCMS Required
I-15 Northbound	8
I-15 Southbound	10
I-215 Northbound	2

This requirement does not relieve the Design Builder from other TMP strategies and responsibilities listed in this Contract and in the TMP guidelines. These PCMS are required in addition to those required near the Project limits and at other critical diversion points outside the list provided in Table 18.3. Additional permanent CMS’s may be available by contacting the Department.

Messages for each PCMS shall be submitted to the Department for approval prior to 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 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 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

Department will supply the signal controller cabinet and signal controller for temporary signal systems. 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 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

Department will provide signal timing for temporary signals. Department will enter the timing parameters into the signal controller. 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 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 Department. The salvaged items will become the property of 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 Department. These salvaged items will become the property of 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

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 to 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-Builts shall be signed by a licensed California Professional Engineer and be provided in both electronic and hardcopy formats.

EXHIBITS

Exhibit 18-A: Lane Requirement Charts

Exhibit 18-B: Lane Requirement Chart Request Form

These exhibits are provided as electronic files.

19 MAINTENANCE DURING CONSTRUCTION

19.1 General

The Design Builder shall perform all Work necessary to meet the requirements associated with maintenance during construction.

Design, construct and maintain the highway right-of-way 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 highway, 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 highway 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 from the Department before proceeding with design or construction.

Use the most current version of each listed standard as of the RFP issue date unless otherwise specified herein or 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	2010 Revised and New Standard Plans
5	Department	Standard Plans 2010
6	Department	Design-Build Modifications to the Standard Specifications
7	Department	Standard Specifications
8	Department	Highway Design Manual (HDM)
9	AASHTO	Roadside Design Guide, 4 th 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 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 Department. In general, this maintenance will include the required maintenance and repair of all Work 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.

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
- Maintenance of temporary fencing

-
- Sweeping of shoulders open to traffic on a monthly basis at active work locations. The presence of K-Rail constitutes an active work location.
 - Removal of debris on open lanes of traffic at active work locations. The presence of K-Rail constitutes an active work location.
 - Graffiti removal
 - Maintenance of storm sewer system related to construction activities
 - Replacement/repair of temporary and permanent barrier wall
 - Maintenance of traffic control devices displaced by Department's snow removal efforts, if supplied by the Design-Builder
 - Landscaping (areas identified as protect and maintain)

The list is not intended to be an all-inclusive description of maintenance activities required to be performed under the Contract Documents. Furthermore, various provisions of the Contract Documents contain requirements applicable to maintenance activities.

The list of maintenance activities noted above do not cover construction-related maintenance, construction –related maintenance is deemed to be included with other items of work and is therefore covered by the Contract Price allocable to such other items of work.

Should the Design-Builder fail to perform any of the required project maintenance activities, the Department reserves the right to perform such work at the Design-Builder's expense.

19.4.2 Department Responsibilities

The Department shall have the right to enter the Project Area at any time to perform maintenance and maintenance inspection. The Design-Builder shall cooperate with the Department on all maintenance issues and shall coordinate with any Department maintenance staff working within the Project Area.

The Department will be responsible for the following:

- Inspections of existing structures,
- Repairs to existing major structures to remain (bridges and overhead sign structures),
- Maintenance of existing facilities that are to remain and are not part of the Work.

19.5 Deliverables

The Design-Builder shall submit the Maintenance Management Plan to Department for their Acceptance within 60 Days after issuance of NTP1.

The Design-Builder shall prepare and submit to 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 conduct 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 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.

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 Request for Proposal issue date unless modified by addendum, change order, or specified herein.

Roadway Pavement Standards and Requirements

Priority	Agency	Title
1	Department	Pavement Policy Bulletins and Exhibit 21-B
2	Department	Design Information Bulletins
3	Department	Highway Design Manual
4	Department	District Pavement Policies and Standards
5	Department	Standard Special Provisions
6	Department	Design-Build Modifications to the Standard Specifications and Plans for Construction
7	Department	Standard Specifications
8	Department	Standard Plans
9	Department	Technical Memoranda
10	Department	California Test Method and Lab Procedures
11	Department	Plans Preparation Manual
12	Department	Project Development Procedure Manual
13	Department	Independent Assurance Manual

Remaining references in Book 3

21.2.2 References

Use the references listed below as supplementary guidelines for the roadway pavement analysis and design. These references are for guidance for the Design Builder.

Roadway Pavement References

Agency	Title
Department	Pavement Technical Guidance
Department	California Department of Transportation Pavement Website,
Department	Guide for the Design and Construction of new jointed Plain Concrete Pavement (JPCP)
Department	Corrosion Guidelines
Department	Slab Replacement Guideline
Department	Jointed Plane Concrete Pavement (JPCP) Preservation and Rehabilitation Design Guide
Department	Ready to List and Construction Contract Award Guide (RTL Guide)
Department	Maintenance Technical Advisory Guide
Precast/Prestressed Concrete Institute (PCI):	
	1.- MNL 116 Manual for Quality Control for Plants and Production of Structural Precast Concrete products
	2.- MNL 120 Design Handbook – Precast and Prestressed Concrete

21.2.3 Reserved

21.2.4 Software Requirements

The Design Builder may utilize statewide approved roadway pavement software listed in the following Caltrans website:

http://www.dot.ca.gov/hq/maint/Pavement/Offices/Pavement_Engineering/Software.html

The Design-Builder shall submit drawings in MicroStation formats on the same version in use by the Department on the date of the Final RFP.

21.2.5 Equipment Requirements

The Design-Builder shall use falling weight deflectometers for field measurements of pavement. The equipment shall meet the requirements of California Test Method CT 356 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 a civil engineer 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 and field testing. All laboratories and testers shall comply with the Department's Independence Assurance Manual.

21.2.8 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 roadway pavement Work during the design and construction stages. The requesting entity shall provide the other entity with not less than five (5) working days prior notice of such meetings. The Design-Builder shall prepare and distribute a record of the minutes to the meeting within five (5) working 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 structure 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 design the roadway pavement within the project limits using all standards and guidance listed in this provision and as described in the *Caltrans Highway Design Manual* (particularly Chapters 600 to 670). Use Exhibit 21-C in lieu of Tables 623.1F and 623.1G from the current version of the *Caltrans Highway Design Manual*. The Design-Builder shall provide a pavement design that meets the following performance requirements. See Section 21.4.4, “*Pavement Rehabilitation Scope of Work*” for more detailed description of pavement work.

For new mainline pavement replace outer 2 to 3 lanes outside lanes and portions of inside lanes or overlay all lanes as shown in these Project Requirements. For transitions between overlay and existing pavement, use designs in Exhibit 21-C for outside lanes.

- Repair concrete pavement to remain in place and mill and overlay asphalt pavement to remain in place
- Replace existing asphalt shoulders adjacent to concrete pavement with concrete shoulders. Resurface remaining existing shoulders on mainline and ramps.
- Rehabilitate the following ramps:
 - I-15/Cleghorn Interchange
 - I-15/Oak Hill Interchange
 - I-15/Route 138 Intechange
 - Southbound Brake Inspection Area Ramps
 - Truck scale ramps from mainline merge to back of gore.
- Replace existing pavement of brake check area.
- 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,
- The material requirements in the *Approved Non-Standard Special Provisions* and *Revised Standard Plans* supersede values in HDM Table 622.1.
- Minimize rutting, and maximize maintainability at intersections,
- The use of geosynthetic materials will not be allowed for pavement thickness reduction,
- Finished pavement shall conform to Caltrans Standard Specifications,
- Remove existing pavement of brake check area and replace it with roller compacted concrete pavement.

The Design-Builder shall consider, at a minimum, the following factors:

- Pavement Design Life
 - The designs provided in Exhibit 21-C are engineered to provide a greater than 40 year design life.
- Soils Characteristics:
 - For any borrow material, the Design-Builder shall perform all necessary California Tests described in Chapter 610 of the *Caltrans Highway Design Manual* to determine the structural quality and attributes of subgrade soils and the R-Value will be greater than 40.
 - The design is based on an R-Value greater than 40.
 - The Design-Builder shall modify and/or provide a subgrade soil that is adequate to carry projected traffic loads during the life of the pavement.
- Climate Regions
 - This project is in the South Mountain Climate Region in accordance with the *Pavement Climate Map*.
 - The Design-Builder shall meet or exceed pavement requirements for the climate region.
- Availability of materials, recycling and maintainability of materials

The Design-Builder shall provide pavement structures that shall consist of a combination of subgrade modifications and/or roadbed materials placed in layers above the subgrade. Materials placed shall conform to the *Caltrans Standard Specifications*. The Design-Builder shall submit complete roadway pavement structural recommendations to the Department for review in compliance with the contract.. Construction of submitted pavement structures shall not commence until the Design-Builder receives notice of Release for Construction. The Design-Builder will receive a response within 15 Working Days of receipt of such submittal. Any subsequent changes in pavement structures shall be documented and processed in accordance to the Standards set forth in this provision.

21.3.3 [NOT USED]

21.3.4 [NOT USED]

21.3.5 [NOT USED]

21.3.6 Pavement Compaction

Pavement Compaction shall be in accordance to the *Special Provisions* and *Standard Specifications*.

21.3.7 Smoothness

The pavement surface shall meet the smoothness requirements in accordance with the *Approved Non-Standard Special Provisions*.

21.3.8 [NOT USED]

21.3. 9 Tapers and Transitions

The Design-Builder shall design and construct tapers and transitions in accordance *with Exhibit 21-B: Pavement Tapers and Shoulder Backing*

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 10 Shoulder Backing and Embankment

Any shoulder backing or embankment work done shall comply with Exhibit 21-B: *Pavement Tapers and Shoulder Backing* and *Standard Special Provisions* and *Standard Specifications* and not exceed the limits of environmental clearance.

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 an inertial profiler as indicated in the *Approved Non-Standard Special Provisions*. The Design-Builder shall supply the inertial profiler and the Certified Qualified Operator (CQO) certified results. Measurements and acceptance will be per the *Approved Non-Standard Special Provisions*. 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 and Treated Base

Existing PCC and AC pavement and treated base of the traveled way and shoulders shall be saw cut full depth prior to removal. Pavement and treated base 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.

21.4.3 Minimum R-Value Requirements

The minimum R-value for the top 4 feet of embankment shall have an R-value of 40 or better. This includes excavated in-situ material within the project limits as well as imported borrow.

21.4.4 Pavement Rehabilitation Scope of Work

- The limits of pavement rehabilitation will be from the end of construction of EA 08-0K7104, I-15/I-215 Devore Interchange Reconfiguration Project. The project EA 08-0K7104 ends approximately at PM R15.98 Northbound and PM R16.37 Southbound, separately. The end of pavement rehabilitation will be at PM 29.8 for both northbound and southbound directions.

21.4.4.1. Lane Replacement Alternative

Lane replacement shall adhere to the same design requirements as new pavement. The following areas of existing pavement shall be reconstructed inside lanes refer to lanes closest to the roadway centerline. Lane numbers start from the innermost lane and increase outwards, e.g., Lane No. 1 is closest to the roadway centerline):

21.4.4.1.1 Outside Lane Replacement

Replace outside 2 lanes with new concrete pavement (lane replacement) from the southerly limit matching the paving limits of project EA 0K7104 to the northerly limit at post mile 29.8 in the northbound direction and from the southerly limit matching the paving limits of project EA 0K7104 to the northerly limit of existing concrete pavement including concrete pavement previously overlaid with asphalt at post mile 29.1 in the southbound direction, except at following locations:

Lanes 3, 4, 5 northbound between PM R17.6 and R18.1 (Transition from 5 to 4 lanes).

Lanes 3, 4, 5 northbound between PM R20.9 (Truck Scale on ramp) to PM R21.15 (Rte 138 off ramp gore end)

Lanes 3, 4, 5 northbound between PM R26.15 and R26.45 (Transition from 5 to 4 lanes).

Match existing longitudinal joint locations except between lanes 2 and 3 which should follow typical section offset of 0.5'). PM R26.45 is end of previous inside widening.

For lane replacement of outer lanes,

The type of pavement (Jointed Plain Concrete Pavement (JPCP), Continuously Reinforced Concrete Pavement (CRCP), Precast Post-tensioned Concrete Pavement (PPCP)) shall be the same for all outer lanes replaced except PPCP-N (non-prestressed alternative) may be placed adjacent to JPCP provided that the spacing of transverse joints matches the JPCP transverse joint spacing and both pavements are tied together across the longitudinal joints in accordance with Revised Standard Plans P-2 and P-15 in this RID. The outer lanes shall be tied together except when using PPCP, the longitudinal joint may be eliminated across the lane line.

The design options for outside lanes in Exhibit 21-C are considered to be laterally supported due to additional 0.5-foot "widened lane" added to inside and 2-feet to the outside or use of tied concrete shoulders. Any changes or elimination of widened lanes will require approval of the Department and will increase the thickness of the concrete pavement by 0.15 foot for JPCP and 0.10 foot for CRCP and PPCP from the values shown in Exhibit 21-C.

21.4.4.1.2 Inside Lane Replacement

Replace inside lanes at locations shown in the following tables:

Table 21-1
 Location
 Approximate
 only

		Locations with AC Overlay	
		Southbound Lanes	
PM	Length(ft')	1	2
29.0-29.1	230		
23.3-23.0	370	x	x
27.1-27.0	160		
19.5-19.3	600	x	x
19.3-19.2	450	x	x
17.0-16.45	2140	x	x
16.4-16.7	190	x	x

Table 21-2
 Location
 Approximate
 only

		Locations with AC Overlay		
		Northbound Lanes		
PM	Length(ft')	1	2	3
18.0-18.1	260	x	x	x
20.0-20.1	190	x	x	x
24.1-24.3	580	x	x	x
29.8	450	x	x	x

Where replacing inside lanes, develop and provide to Department a new profile which provides smooth alignment in accordance with HDM Chapter 200.

The type of pavement (JPCP, CRCP, PPCP) shall be the same for all inside lanes replaced except PPCP-N (non-prestressed alternative) may be placed adjacent to JPCP provided that the spacing of transverse joints matches the JPCP transverse joint spacing and both pavements are tied together across the longitudinal joints. The inner lanes shall be tied together except when using PPCP, the longitudinal joint may be omitted across the lane line of the 2 outer lanes and may be untied between the inner 2 lanes on 3-lane inside section.

The design options for replacement of inside lanes in Exhibit 21-C are considered not to be laterally supported. Any changes that would create lateral support condition as defined in Highway Design Manual Topic 623 would allow for the reduction in thickness of the concrete pavement by 0.10' for JPCP, CRCP, and PPCP-N from the values shown in Exhibit 21-C. There would be no reduction in thickness for PPCP.

21.4.4.1.3 For lane replacement between inside and outside lanes,

The pavement type may be different between inside and outside lanes.

Installing tie bars between inside and outside lanes is not required. Use isolation joint per Revised Standard Plan P-18 of these Project Requirements.

Installing tie bars across longitudinal joints between new and existing concrete pavement is not recommended.

21.4.4.2 Lane Overlay Alternative

21.4.4.2.1 HMA Lane Overlay

Mill and overlay minimum 0.20' existing asphalt concrete in northbound #1 lane and adjacent shoulder from southerly limits of project to end of asphalt lane at about PM R18.1.

21.4.4.2.2 Concrete Lane Overlay –

In lieu of lane replacement and HMA lane overlay, the Design-Builder may overlay mainline pavement using overlay option in Exhibit 21-C.

For lane overlay:

- Both inside and outside lanes and shoulders will be overlaid.
- Overlays should be at least ½ mile in length.
- Pavement type should be consistent across all lanes.
- All lanes shall be tied to each other with tie bars or reinforcement.
- If overlaying at northern limits of project, extend overlay to northern limits and then construct taper at 400:1 or engineered profile to match existing pavement surface north of project using HMA. Use 0.25' HMA-C for top course.

The design options for overlay in Exhibit 21-C are based on all CRCP lanes being tied together with tied concrete shoulders or “widened lanes.” Any changes that would create no lateral support condition as defined in Highway Design Manual Topic 623 would require increasing the thickness of the CRCP by 0.10' from the values shown in Exhibit 21-C.

The cost for replacing the underlying base is included in the lump sum price “Lane Replacement”.

21.4.4.3 Shoulders

21.4.4.3.1 Outside Shoulders

Replace the outside shoulder of the mainline to at least the minimum thickness for shoulder pavement in Exhibit 21-C, except as follows below. For Reconstruct the first 2 feet adjacent to the outside lane with the same design and constructed as part of the outside lane.

- For outside shoulders adjacent to mainline freeway in the northbound direction from approximately post mile R20.8 to R26.5, reconstruct or overlay the shoulder to match the TI of the adjacent lane in accordance with Index 613.5 (2)(b) of the Highway Design Manual, using the outside lane design options in Exhibit 21-C. For this shoulder use a tied concrete shoulder option in Revised Standard Plan P-1 of these Project Requirements.
- Existing concrete shoulders may be left in place except the 2 feet adjacent to outside lane shall still be replaced with the outside lane.

21.4.4.3.2 Inside Shoulders

- In northbound direction between southerly limit of project and Post Mile R18.1 see Section 21.4.4.2.1, “HMA Lane Overlay” for strategy.
- For all other locations, replace inside (or median) shoulders of the mainline to at least the minimum thickness for inside shoulder pavement in Exhibit 21-C. JPCP for inside shoulders shall be doweled as per Revised Standard Plan P-1 of these Project Requirements. Use isolation joint when adjoining existing concrete pavement. Use tie bars when adjoining concrete pavement lane replacement or overlay. Match the superelevation and transition of adjacent lane. On tangent section, slope pavement at 2% away (or opposite to) the cross slope of the adjacent lane.

21.4.4.4 Ramps

- At the following ramps:
 - I-15/Cleghorn Interchange
 - I-15/Oak Hill Interchange
 - I-15/Route 138 Intechange

Mill and overlay a minimum of 0.25 feet of HMA Type C with a 1-inch gradation and a PG 64-28 PM Asphalt Binder pavement including at tapers and transitions. The limits of mill and overlay will be from left edge of pavement to right edge of pavement. Concrete ramp termini shall be provided only for off ramps for SR-138 for both northbound and southbound directions. The limit of ramp termini for southbound off ramp will be from edge of shoulder of Route 138 and extend back a length of 300 feet along ramp The limit of ramp termini for northbound off ramp will be from edge of shoulder of Route 138 and extend back 150 feet along ramp. The lateral limits of the ramp termini shall match the left and right edges of pavement.

- Replace asphalt shoulders on the southbound brake inspection area ramps with outside shoulder design option in Exhibit 21-C.
- Replace lane shoulder and gore area of the truck scale ramps from freeway to end of gore area with outside lane design option in Exhibit 21-C.

21.4.4.5 Break Check Area Pavement Rehabilitation

Design Builder shall remove existing HMA pavement from parking area and ramp shoulders, and replace it with 0.75’ of JPCP with roller compacted concrete (RCC). Work shall be performed in such a way that at least 50% of the parking area will be operational at all times.

21.4.4.6 Concrete Panel Replacement

Replace failed slabs in existing concrete lanes not to be replaced and where concrete pavement will be overlaid.

Damaged concrete panels within the traveled way and shoulders shall be replaced in accordance with these Project Requirements. The Contract Price shall include a lump sum price "Concrete Panel Replacement" for an estimated 600 cubic yards of concrete panel replacement work.

The unit price specified in Form 9 shall include all work required for individual slab replacement, including but not limited to existing pavement removal; base replacement, slab fabrication, transportation, and installation; traffic control, dowel bars, and tie bars.

At a minimum replace existing concrete slabs at the following times:

- Prior to initiating lane replacement.
- Prior to overlaying location of individual slab replacement.
- As last order of work prior to acceptance of Contract
- If ordered by the Department..
- At any other time of the Design-Builder's choosing provided traffic handling requirements of contract are met. Notify the Department when planning to do individual slab replacement at least 5 days in advance.

The Department may order slab replacements in areas identified for lane replacement under this contract..

Prior to performing slab replacements, identify the slabs that meet the criteria to be replaced by marking boundary with orange paint. Notify and provide the Department 5 working days to review the locations for removal. Replace any additional slabs identified by the Department. Do not replace slabs rejected by the Department for replacement.

For all occasions except for final time prior to Final Acceptance, replace slabs that have:

- One or more corner cracks where corner is settled more than ¼"
- Transverse or longitudinal cracks where:
 - Portion of the slab has settled more than ¼" in relation to rest of slab or adjoining slabs, and/or
 - 1 or more cracks with width of ¾" or more
- Spalls
 - greater than 12" in width as measured from the joint or crack, or
 - deeper than 1/3 depth of the slab.
 - greater than 2" in width and extend for more than 25% of the length of the joint or crack.
- Containing at least two interconnecting cracks (3rd stage cracking) of which at least one is at least ¾" in width. Interconnecting cracks may be a combination of transverse, longitudinal, and corner cracks within the same slab.
- Observed to be "rocking" (moving up and down in relation to adjacent slabs) when traversed by vehicles or trucks.

In addition to the above criteria, when replacing slabs as a last order of work prior to Final Acceptance replace slabs that have:

- Corner cracks at least 3/8" in width.
- 2 or more corner cracks.
- 3rd staging cracking with crack(s) at least ¼" in width.

Slab replacements done where pavement will be overlaid or replaced as part of these Project Requirements shall be Type II as defined in *Revised Standard Plan P8* of these Project Requirements and will use rapid strength concrete option per Section 41-9 of the *Special Provisions* for these Project Requirements. All other

slab replacements shall use precast concrete conforming to the *Approved Non-Standard Special Provisions* of these Project Requirements.

The thickness of the individual slab replacement shall match the thickness of the existing concrete pavement except when using precast concrete, the thickness may be up to 0.04' thicker provided adequate adjustments are made to the base.

Prior to placing new concrete slab, replace underlying base in accordance with the *Special Provisions* and these Project Requirements.

Existing pavement adjacent to slab replacement shall not be damaged during removal or placement of new concrete slabs. Damage which matches the requirements for concrete slab repair of these Project Requirements shall be repaired in accordance with the instructions of these Project Requirements at Design Builder's expense. Damage which matches the requirements for individual slab replacement shall be replaced at the Design Builder's expense.

21.4.4.7 Base Replacement

Replace underlying base beneath all individual slab replacements. Replace in accordance with the *Standard Special Provisions* and *Standard Specifications* to no less than the existing depth of treated base.

The cost for replacing the underlying base is included in the lump sum price for "Individual Slab Replacement".

21.4.4.8 Spall Repair

Repair spalled joints by removing unsound or damaged concrete and filling the area with polyester grout in accordance with the *Approved Non-Standard Special Provision* and *Revised Standard Plans*.

Transverse spalls in PCC pavement that do not meet the criteria for individual slab replacement and exceed four (4) inches in length in the direction of travel or one that adversely affects ride comfort shall be repaired. Longitudinal spalls that adversely affect ride quality shall also be repaired.

Prior to performing spall repair, identify the cracks that meet the criteria for crack repair by marking with orange paint. Notify and provide the Department 5 working days to review the locations for repair. Repair any additional spalls identified by the Department to repair. Do not repair spalls rejected by the Department.

The Contract Price shall include a lump sum price "Repair Spalls" for an estimated 2,600 SQYD.

The unit price specified in Form 9 shall include all work required for spall replacement, including but not limited to spall identification, removal of existing concrete, placement of new concrete and protection of joint.

21.4.4.9 Crack Repair

Concrete slabs with longitudinal or transverse cracks that do not meet the criteria for individual slab replacement in these Project Requirements shall be repaired as follows as last order of work prior to end of contract:

- Route and seal cracks ¼" or wider.
- Dowel bar retrofit transverse cracks with polyester concrete.

The Contract Price shall include a lump sum price "Route and Seal Concrete Crack" for an estimated 2,600 linear feet and "Dowel Bar Retrofit Crack (8 dowels)" for an estimated 260 locations.

The unit price specified in Form 9 for Route and Seal Concrete Crack shall include all work required for for route and Seal concrete Crack, including crack identification, and routing and sealing cracks.

The unit price specified in Form 9 for Dowel Bar Retrofit Crack (8 dowels) shall include all work required for dowel bar retrofit crack including crack identification, removal of existing concrete, placement of new polyester concrete and dowel bars.

Route and seal cracks and dowel bar retrofit shall be in accordance with the Section 41-5 *Approved Non-Standard Special Provisions* and *Revised Standard Plans* of these Project Requirements.

Prior to performing crack repair, identify the cracks that meet the criteria for crack repair by marking with orange paint. Notify and provide the Department 5 working days to review the locations for removal. Repair any additional cracks identified by the Department to repair. Do not repair cracks rejected by the Department.

The Design-Builder may at their option replace slabs in lieu of repairing cracks. Slabs replaced at Design Builder's option will be counted as part of the allotted work for crack repair of this Contract.

21.4.4.10 - Continuous Diamond Grinding

The Design-Builder shall grind the edge of the existing concrete pavement where it will interface with new concrete pavement. The width of the grinding shall be a minimum of 3 feet. This grinding shall be performed prior to construction of the adjacent new concrete pavement. All existing concrete lanes and slab replacement to remain at end of contract will be ground per the *Standard Specifications*.

21.4.4.11 Grinding

Grind all PCC pavements in existing southbound lanes 1 and 2 and northbound, lanes 1, 2, and 3. .

All grinding will be done in accordance with the *Standard Specifications* and *Standard Special Provisions*.

21.4.4.12 Seal Concrete Pavement Joints

The Design Builder shall seal all new and existing joints including expansion joints, isolation joints, contraction joints and transverse construction joints using preformed compression seals. Longitudinal construction joints need not be sealed except for PPCP which shall be sealed. Sealing shall be per the *Revised Standard Plans* and *Special Provisions*. Do not seal until concrete placement, repair, grinding and grooving has been completed for the location to be sealed.

21.4.4.13 Digout Asphalt Pavement

Digout and replace asphalt pavement in ramps and other locations of asphalt pavement to remain by removing unsound or damaged asphalt pavement and base and filling the area with new asphalt pavement and possible aggregate base in accordance with "Replace Asphalt Pavement" of the *Standard Special Provision*. Locations and dimensions of digout asphalt pavement shall be determined by the Department.

The Contract Price shall include a lump sum price "Digout Asphalt Pavement" for an estimated 30 cubic yard.

21.4.4.14 Precast Prestressed Concrete Pavement

- Contract plans contain State's design for a precast prestressed concrete pavement system for lane replacement (PPCP) and individual slab replacement with precast concrete pavement ISR (PCP). Design Builder can build State's design or propose modifications as allowed in the *Special Provisions* or alternatives which comply with the requirements in the *Special Provisions*.
- The thickness shown in Exhibit 21-C for PPCP applies to the design in the *Precast Standard Plans* and may need to be altered to adjust for any plan modifications.
- The Design-Builder may propose a non-post tensioned precast system in lieu of PPCP. If proposed: Quality control, submittals, materials and construction must still match the requirements in the *Special Provisions*. Use the thicknesses for PPCP-N in Table 1.

21.4.4.14.1 System Description

- Design precast components in accordance with the *Approved Non-Standard Special Provisions*, and these Project Requirements.
- Fabricate and install concrete units in accordance with the *Approved Non-Standard Special Provisions* and these Project Requirements. ,

21.4.4.14.2 Submittals

A.- Plans:

- 1.- Show layout, dimensions, and identification of each precast unit corresponding to sequence and procedure of installation.
- 2.- Casting, consolidation, and finish procedure

B.- Submit concrete mix design as specified in *the Standard Specifications* and *Special Provisions* .C.- Comply with the submittal requirements specified in Section 52, “*Concrete reinforcing*”, and Section 50 “*Prestressing Concrete*” of the *Standard Specifications* .

D.- Product Data: Submit manufacture’s product data of manufactured products and accessories. Include manufacture’s detailed drawings and dimensions when applicable.

E. Quality Assurance Submittals:

- 1.- Submit evidence of current plant certification under the PCI Plant Certification Program.
- 2.- Submit qualifications of fabricator including a list of three successfully completed precast jobs of similar type and size to the project. Include a detailed description of the fabricated pavement, project name, location, Design-Builder, and Department.
- 3.- For welders, furnish welders certificates or affidavits attesting to the welders’ qualifications to perform the indicated and specified welding

21.4.4.14.3 Qualification of the Fabricator

Plant shall be PCI certified under the PCI Plant Certification Program or equivalent and regularly in design and construction of structural precast concrete with a minimum of (5) years experience. PCI Certification shall be in a product group and category appropriate to the work.

21.4.4.14.4 Delivery Storage and Handling

- A.- Store units in a manner that will prevent spalling, cracking, distortion, staining, or other damage and protect the units from wind, rain and other environmental conditions. Units shall be stored above ground on skids or other supports to keep items free of dirt and other foreign debris.
- B.- Units damaged by improper storage or handling shall be replaced or repaired to the satisfaction of the Department.

21.4.4.14.5 Fabrication

- A.- Field verify dimensions shown on the Contract Drawings prior to fabrication of any precast concrete structure. Notify the Department of any differences between filed measurements and those shown on the Contract Drawings.
- B.- Repair and replace any unit that does not conform to the dimensions or structural standards shown on the Contract Drawings or specified herein, and which is not suitable for use as determined by the Department.
- C. – All pre-cast panels will be cast and cured in an controlled structure protecting the units from wind, rain and other environmental conditions.

21.4.4.15 Temporary Pavement

The Design Builder shall analyze and prepare separate pavement designs, as applicable for temporary pavement. The Design-Builder may construct pavement for temporary widening and detours to facilitate construction provided it is within the study limits of the Environmental Clearance. Work outside these limits will require Contractor to produce and obtain all necessary approvals for updated environmental clearance and permits.

The Design-Builder shall design, construct, and maintain temporary pavement as necessary.. Temporary pavement must be engineered to handle traffic loads while the detour is in place without cracking, rutting, ravelling, spalling, bleeding, or faulting that may impact the safety and comfort of the travelling public with a minimum design life of 3 years. The temporary pavement shall be constructed in accordance with the Standard Special Provisions and Standard Specifications after the Department approval.

Repairs which may impact the travelling public as determined by the Department shall be done at Design Builder's expense and may be subject to the penalties of these Project Requirements.

Temporary pavement and detours must be removed and surfaces restored to their original condition prior to acceptance of contract. This includes restoring to original condition any drainage facilities and sign structures altered by the temporary pavement.

Existing pavement including shoulders may be used for temporary traffic handling. The Design Builder must verify that existing pavement will handle temporary traffic loads without requiring repair while being used for traffic. Any existing pavement replaced prior to handling temporary traffic loads must at least meet the thicknesses in Exhibit 21-C and the performance requirements for final pavement in these Project Requirements for the end of contract and during the 1 year guarantee period. Any existing pavement used for temporary traffic handling must meet the requirements for smoothness in accordance with the *Approved Non-Standard Special Provisions* and Standard Specifications for new pavements and overlays.

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 Report

- The Design-Builder shall submit in electronic format the following information to the Department:
- Unified soil classification of the subgrade soil at a frequency of one test per every mile per lane constructed or overlaid.
- Depth and type of pavement placed, at a frequency of one test per every mile per lane constructed or overlaid.
- Depth and type of subbase and/or base layers, at a frequency of one test per every mile per lane constructed or overlaid.

GPS coordinates shall be provided for each location tested.

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*.

The Design-Builder shall submit one hardcopy and one electronic copy of the Materials Report. The Materials Report shall be prepared in reference to Topic 114 of *Caltrans Highway Design Manual*.

21.5.2 Over-the-Shoulder Review of 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 acceptable format and organized to facilitate their review.

21.5.3 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.

21.5.4 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.

21.5.4.1 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.

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 Department.

21.5.4.2 Non- Standard Specifications and Non-Standard Special Provisions

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.

21.5.5 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.

21.5.6 Inertial Profiler and Data Core Data

The Design-Builder shall submit inertial profile data and data cores as completed in accordance with Sections 39 and 40 of the *Approved Non-Standard Special Provisions* and associated *Standard Specifications*.

21.5.7 Quality Control Documents

The Design-Builder shall submit quality control reports and test results as completed in accordance with the *Special Provisions* and associated *Standard Specifications*.

EXHIBITS

Exhibit 21-A: Joints, Terminals, and Bond Breaker Standards for Concrete Pavements

Exhibit 21-B: Tapers and Shoulder Backing

Exhibit 21-C: Concrete Pavement Design Options

All exhibits are provided as electronic files

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 Department before proceeding with design and/or construction.

Use the most current version of each listed standard as of the RFP issued date unless specified herein or 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	Caltrans 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. Caltrans NPDES Permit 2012-DWQ
2. Caltrans 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)

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 Caltrans Highway Design Manual)
FHWA	Hydraulic Design Series (as listed in Caltrans Highway Design Manual)
CASQA	California Stormwater Quality Association (CASQA) Construction BMP Handbook

22.2.3 Preliminary Engineering Plans

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 *Caltrans Project Planning and Design Guide* and design guidance documents. The Design-Builder may use the plans and specifications developed by Department or they may choose to develop a special design to fit the project needs with coordination and approval of 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 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 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 level SWDR information (see Exhibit 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.

22.2.4 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. The stormwater design should be based on 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 Department must meet including, but not limited to safety, aesthetics, and maintenance.

22.2.4 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 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.

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 *Caltrans 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 *Caltrans 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 [NOT USED]

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 *Caltrans 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 *Caltrans 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.

22.3.3.3 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, *Caltrans 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.

22.4 Construction Requirements

The stormwater requirements shall be in accordance with the Caltrans NPDES permit 99-06-DWQ, the Construction General Permit 2009-0009-DWQ, the *Caltrans Construction Site BMP Manual*, *Caltrans Construction Site Storm Water Quality Sampling Manual*, Plans, Specifications, and *Caltrans 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 [NOT USED]

22.5.2 Released for Construction Documents (RFC)

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

- Storm Water Data Report (follow Caltrans PPDG for equivalent of PS&E level SWDR and must be stamped)

- Electronic Excel SWDR
- SWPPP 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

Department will file Notice of Intent (NOI) and submit and file the Notice of Termination at the Completion of the project.

As part of compliance with the CGP, the Design-Builder shall:

Submit all permit registration documents (PRD's) to the Department

- a) Risk Assessment (CGP Section VIII)
- b) Storm Water Pollution Prevention Plan (CGP Section XIV)
- c) Signed Certificate Statement

Complete Rain Event Action Plans (as required) Complete and submit the annual report (CGP Section XVI)

22.5.3.1 Drainage Plans

As part of the drainage plans, show the locations of all structural stormwater treatment BMPs including bio-filtration strips and swales.

22.5.3.2 Temporary and Permanent Erosion Control Plans

Temporary BMPs shall be included in the plans and included in the SWPPP, using the Caltrans 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.

22.5.3.3 Specifications and Special Provisions

If the Design-Builder requests Department's Approval to use methods or materials that are not 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.

22.5.4 Reports/Project Documentation

The Design-Builder shall provide 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.. The SWDR shall include all the pertinent stormwater information required in the PPDG.

22.5.5 As-Built Plans

Upon completion of the Project, the Design-Builder shall deliver to 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

Exhibit 22-A: PID Stormwater Data Reports

This exhibit is provided as an electronic file.

23 [NOT USED]

24. [NOT USED]