STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

PROJECT REQUIREMENTS
BOOK 2

FOR DESIGN AND CONSTRUCTION ON STATE HIGHWAY IN
SAN DIEGO COUNTY IN SAN DIEGO ON I-805
FROM JUST NORTH OF SR-52 TO JUST NORTH OF MIRA MESA BOULEVARD

DISTRICT 11, ROUTE 805

CONTRACT NO. 11-2T2004
11-SD-805-PM 23.2/26.7
Project ID 11000201914

Dated: October 4, 2011

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EXHIBITS

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

1. Horizontal alignment

   The horizontal alignments for the roadways may be changed 1 foot, or within the Right-of-Way (R/W) limits, whichever is less, except that the horizontal alignments shall not be moved closer to existing businesses or residences immediately adjacent to the corridor.
2. Lane and shoulder widths
3. Number of lanes
4. Location and number of roadway access points
5. Median type
6. Approximate location of Project limits

1.3.2 Project Limits

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

- North Project limit – Approximately Station 1491 + 50.00
- South Project limit – Approximately Station 1285+00.00

The lateral limits of the Project shall extend to the locations necessary to complete the Work and meet the Project requirements. Lateral limits on cross streets shall be as needed to tie Work on Interstate 805 from State Route 52 to just north of Mira Mesa Boulevard into the existing cross-street, to a line perpendicular with the cross street curb return, or to the extent necessary to construct drainage facilities, whichever is more extensive.

1.3.3 General Description

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

The Project generally consists of designing and constructing one (1) High Occupancy Vehicles (HOV)/Bus Rapid Transit (BRT) lane in each direction from just north of SR-52 to just north of Mira Mesa Boulevard and the south facing Direct Access Ramps at Carroll Canyon Road.. Additional major responsibilities will be environmental management, public relations, railroad and utility coordination, among other things.

The Project features will include but are not limited to***]***:

- Median widening of the Governor Drive undercrossing
- Median widening of the Rose Canyon Bridge and Overhead
- Outside widening of both the existing northbound and southbound Carroll Canyon (Soledad Canyon) Bridge and Overhead (BOH)
- Construction of the new south facing Carroll Canyon Direct Access Ramps (DAR)
- Construction of the Carroll Canyon Tie Back Walls
- Outside widening of the northbound Mira Mesa Boulevard undercrossing
- Noise abatement which includes the berm /wall combination along the southbound off-ramp to Governor Drive
- One HOV/BRT lane in each direction from just north of SR-52 which will join, be compatible, and provide continuous HOV/BRT lanes with Contract EA 2T0404
- All I-805 North median improvements including the construction of a concrete median barrier, all median grading, ultimate median drainage, all median signs, any required electrical, all structural section components including AC and PCC paving for the Ultimate I-805 North facility
- Partial outside widening from La Jolla Village Drive to the Carroll Canyon Bridge and Overhead which includes grading, drainage, retaining walls, any required electrical, signs, all structural section components including AC and PCC paving
- Ultimate outside widening in the northbound direction from the Carroll Canyon BOH to the northern limits of the project including all grading, drainage, retaining walls, electrical, signs, all structural section components including AC and PCC paving
- Fiber optics from the south end of the northbound Carroll Canyon BOH to the fiber optic vault located at approximately station 1490+00.00
- All modifications of existing signalization
- Landscaping and irrigation
- Environmental compliance and mitigation
- Signing and striping
- Lighting
- Public information activities
- Visual quality management
- Erosion control including slope stabilization and permanent storm water pollution prevention measures.

1.3.4 Cooperation

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

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

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.

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

1.3.4.1 Department

11-2T0404 - In San Diego County in San Diego on Interstate 805 from 0.3 km south of Soledad Canyon Bridge and Overhead to 0.6 km north of Interstate 5/805 separation. Construct a north facing Direct Access Ramp at Carroll Canyon.

11-089754 – In San Diego County in San Diego from 0.5 mile south of La Jolla Village Drive to 0.1 mile north of Eastgate Mall overcrossing. Interchange improvements and road widening.

11-081614 – In San Diego County from 0.3 mile north of Telegraph Canyon Road undercrossing to 0.4 mile south of La Jolla Village Drive. Barrier rail upgrades.

1.3.4.2 SANDAG

SANDAG Contract No. 1239801 – LOSSAN Corridor Sorrento-Miramar Double Track Phase 1.

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 provide Project meeting minutes within seven Days or by the next regularly scheduled meeting for review and comment by the Department prior to making Final.

2.2 Cost Management

2.2.1 General

The Design-Builder shall perform all Work necessary to meet the requirements of Cost Management in accordance with the requirements associated of the Contract Documents and these Technical Provisions. In general, this includes, includes preparing, processing, revising, and submitting of invoices and progress reports.

2.2.2 Administrative Requirements

2.2.2.1 Payment Breakdown

Following NTP1, the Design-Builder shall develop a payment breakdown based on Form 9 of the ITB 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 day 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 technical and 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
- Human Resources Management
- Safety Management
- Public Information Management
- Environmental Management
- Maintenance During Construction
- Payment for insurance and bond 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.

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 for construction/maintenance and non-construction personnel by classification of management, engineering, and other technical personnel used on the job.
   - Underutilized Disadvantaged Business Enterprise (UDBE) progress and Project updates
   - Equal Employment Opportunity (EEO) progress and Project updates
   - Update on labor compliance unresolved issues
4. Quality updates
   - Summary of quality audits and quality control processes performed
   - Listing of non-conformances and resolutions
   - Summary of Quality Manual updates
5. Public Information updates
   - Summary of public input received and responses
   - Summary of media contacts
   - Summary of complaints and resolution
6. Environmental compliance
   - Summary and copies of environmental monitoring reports
   - Summary of non-compliance issues and resolution
   - Summary of agency inspections
7. Utilities
   - Status of private utility work performed and required
   - Status of public utility work performed and required
8. Geotechnical
   - Summary of vibration and settlement monitoring activities and issues
   - Copies of vibration monitoring reports

- Copies of settlement monitoring reports

9. Maintenance of Traffic
    - Summary of traffic switches and a look ahead to future traffic switches
    - Summary of known traffic incidents within the Work zone
10. Visual Quality
    - Summary of visual quality activities
    - Summary of recommendations and decisions
11. Change Orders
    - Summary of outstanding change orders

2.2.3 Deliverables

2.2.3.1 Invoices

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

2.2.3.2 Monthly Progress Reports

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

2.2.3.3 Original Payment Breakdown

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

2.2.3.4 Revised Payment Breakdown

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

2.2.3.5 Design Breakdown Report

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

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

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 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 Calendar Days after being received. Schedules that are not accepted shall be corrected by the Design-Builder within seven 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 Calendar Days.

2.3.2.8.2 Schedule Updates

The Department will accept or return comments on submitted schedules within seven Calendar Days after being received. Schedules that are not accepted shall be corrected by the Design-Builder within seven 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 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 Calendar Days. It is the Design-Builders responsibility to meet with Department as often as necessary to satisfy the Department's comments within said seven 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 40 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".

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 Department. The Design-Builder shall remove any Lags/Leads and replace them with an activity identifying the Lag/Lead upon request of 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 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 recommended (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 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 10 Days, sorted by Early Start
- Upcoming and pending coordination required with 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

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.
- 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 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 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 plans, quality procedures, Work instructions, and records. The Design Builder shall perform Quality Control and Quality Assurance activities for the design and construction of the Project in accordance with the policies and procedures defined in this Section 2.4.

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

2.4.1.2 Department Role

The Department will provide oversight of the Design-Builder's Quality Program and the Department will perform the duties of the Independent Quality Assurance (IQA).

2.4.1.3 Quality Management Goals

2.4.1.3.1 Integrated Program

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

- Establishes comprehensive quality management processes and procedures.
- Integrates the quality goals of both the design and construction elements of the Project.
- Ensures the minimum standards as defined in Section 2.4.2.1. and procedures for quality management are met.

- Assigns the responsibilities for specific quality management functions.

2.4.1.3.2 Design Quality Management

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

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

2.4.1.3.3 Construction Quality Management

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

- Provides quality measures and encourages continuous improvement of the construction phase.
- Educates all construction staff of their role in the Quality Management Program and ensures they understand their role is to build the Work in accordance with the Released for Construction Documents and the Project requirements.
- Ensures all construction quality assurance staff understands their role is to determine whether the Work meets the Project requirements.
- Integrates all Subcontractors and Suppliers in the construction Quality Management Plan.
- Involves the Department throughout the entire construction process.
- The Design-Builder shall abide by and be responsible for all local and federal agency laws (Air quality, dust control, etc.)

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 its entire 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 is both effective and efficient and best fits the needs of the Project and both parties.

2.4.2 Administrative Requirements

2.4.2.1 Standards

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

- Caltrans Standard Specifications May 2006
- 2010 Standard Plans
- Special Provisions*
- Department Technical Memoranda
- Project Development Procedure Manual

- Caltrans Construction Manual
- Bridge Construction Records and Procedures Manual, Volumes I and II
- Caltrans *CADD Manual**
- Surveys Manual
- OSFP Information and Procedure guide
- Manual for QC and QA for Asphalt Concrete
- 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 design and construction quality aspects, as well as documentation requirements for the Project. The Department will audit the Design-Builder's Quality Program to determine whether quality activities are being carried out and implemented effectively.

The Design-Builder shall perform Quality Control and Quality Assurance activities for the design of the Project in accordance with the policies and procedures defined in the Quality Manual described in Section 2.4.2.3. The Design Builder's Quality Control activities shall include, but not be limited to, the total of all design and construction activities to ensure that a product meets Contract requirements. The Quality Assurance activities shall include, but not be 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 meet Contract requirements. The Design Builder shall also perform construction quality control 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 Assurance personnel shall be independent from and have no responsibilities with the production of the Work.

The Department's oversight role is to perform Independent Quality Assurance that includes review and audits of the design and construction products and the Design Builder's Quality Control and Quality Assurance activities. Department will perform Independent Quality Assurance (IQA) activities that are an unbiased and independent audit and evaluation of all the technical checks, sampling, testing procedures, and equipment calibration.

The Department will perform contract acceptance testing and inspection for verification that the Work meets Contract requirements.

The Design-Builder shall document quality activities and maintain quality data in accordance with the policies and procedures defined in the Quality Manual. The Design-Builder shall provide a 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's quality procedures are not adequate (as evidenced by the Department oversight reviews or problems during design or construction), the Department may, at its sole discretion, withhold payment for design and construction until sufficient quality procedures are in place. If construction is in progress, the Department may suspend ongoing Work represented by the deficient quality procedures and require correction of design and/or construction defects.

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 Section 11 of Book 1.

Subject to the Department 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 Quality Manual (QM)

2.4.2.3.1 Quality Manual – General

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

The Department shall approve the Quality Manual prior to start of any work and shall be in effect until all requirements of the Contract have been fulfilled and the Project is Accepted.

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

Design-BuilderDesign-BuilderDesign-BuilderDesign-Builder2.4.2.3.2 Quality Manual – Template

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

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

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

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

- Unique and/or innovative design items

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

2.4.2.3.3 Quality Manual – Responsibility

The Quality Manual shall

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

Quality Manual Personnel/Staff

The Design-Builder's Quality Manager shall:

- Be Approved by the Department.
- Have overall responsibility for the success of the Quality Program
- Have no responsibilities in the production of the Work.
- Verify and provide confidence that the Work meets or will meet the contractual requirements.
- Be the point of contact to resolve non-conformances and project quality issues with the Department.
- Report to the Design-Builder's Executive Management Committee and be independent of the Design-Builder's Project Manager.
- Provide the Department Contract Manager with all the reports and documents generated under this contract.
- Have the authority to stop work.

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

None of the Design-Builder's quality staff has 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 Assurance team 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 structural inspectors shall be registered Professional Engineers in the State of California or shall have the applicable Department Technical Certifications for the Work performed under the Critical Activity Point.

Management Accountability

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

Management Review

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

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

The management reviews shall, at a minimum, review the results of internal audits, the 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.

2.4.2.3.4 Quality Manual – Design

General

All design 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 describe how all design criteria, Contract requirements, and other design inputs are defined, reviewed, and approved.

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

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

Design Output

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

The Design Builder shall ensure that all structure calculations (performed using software and manually) are independently checked by a California Registered Engineer with 10 years minimum experience. The Design Builder shall ensure that all calculations are verified.

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 appropriate licensed individual. For example, roadway and structure plans should be signed by a California Licensed Civil Engineer, Highway Planting and Irrigation Systems shall be designed under the authority of a California Landscape Architect, and Electrical Plans shall be signed by a California Registered Electrical Engineer, etc.

All Released for Construction Documents shall meet the following requirements:

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

The Design-Builder shall ensure that all special provisions, shop drawings, survey notes and other items necessary to construct the Work are submitted as Released for Construction Documents. RFC packages shall include the following (at a minimum):

- Cover sheet with submittal description and schedule activity identification
- Design Quality Manager Certification in accordance with the Quality Manual
- Environmental Compliance Managers Certification
- Design plans
- Design calculations
- Design reports
- Specifications
- Governmental, Utility Owner, and Railroad approvals including Public Interest Finding Statements and Fact Sheet Exceptions to Separate Contract Policy for Highway Planting Projects.

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

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

Shop and working drawings and calculations for excavation shoring, cribs, cofferdams, falsework, 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 the Department.

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

As-Built Documents

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

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

- As-Built Documents shall include all base mapping (topography), design plans (including shop drawings), design calculations, design reports, specifications, and electronic CADD data.
- The Design-Builder shall ensure that all title blocks of calculation sheets include the calculation title, file number, page number, initials of the designer and the checker, and dates of design and checking.
- The Design-Builder shall ensure that all calculations indicate the design requirement, the assumptions made, the methods used, the source of the information, and the cross-reference for the applicable design drawings.
- The Design-Builder shall 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 the Department all original diaries, logs, notebooks, accounts, records, reports, and other documents prepared in the performance of the Contract upon completion or termination of the Contract.

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

Over-the-Shoulder Reviews

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

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

It is the intent of these reviews to check for concept, level of detail, design criteria, and fatal flaws. Comments made by the oversight team will be considered non-binding. It is the Design-Builder's responsibility to conform to the Contract requirements. These reviews will not routinely include detailed calculation or drawing reviews, although the Department retains the right to perform detailed reviews of any item at any time. If mutually agreed upon between the parties, for specific review items, the over-the-shoulder review may consist of an exchange of electronic files between the Design-Builder's designer and the Department.

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

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

In-Progress Design Workshops

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

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

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

- A list of the participants in attendance, 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 the Department, the Design-Builder is not meeting the goals and objectives of the Quality Manual, the Design-Builder shall suspend all Project work and 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 (6 copies)	30 Calendar Days
Design Plans(10 copies)	20 Working Days
Structure Plans(10 copies)	20 Working Days
Structures Hydraulics Report (2 copies)	15 Working Days
Bridge Load Rating Report (2 copies)	15 Working Days
Seismic Assessment Report (2copies)	15 Working Days
Type Selection Report (2 copies)	15 Working Days
Geotechnical Report (2 copies)	15 Working Days
Shop Plans(6 copies)	15 Working Days
Released for Construction Submittal (10 copies)	15 Working Days
Other Reports/Plans (TBD)	***
Design Exceptions (5 copies)	30 Calendar Days

RFI Submittal (3 copies)	3 Working Days

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

For non-standard specifications and special provisions for non-pre-approved manufactured products or materials, the Department's review times will vary and depend on the content. A typical submittal review time for non-standard special provisions and specifications requires a minimum of 6 months. The Design-Builder is required to submit any non-standards details, products, or documents to the Department for review and approval as soon as the need is identified.

Products that are not on the Caltrans Pre-Qualified Products List shall be required to go through the Caltrans New Product Evaluation process, unless exempted by the Department.

These review timelines depict the maximum allowed time the Department has to review the associated submittals and respond to the Design-Builder without impacting the overall Project schedule. Each design package above may go through multiple iterations of review by the Department before 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. The Department, however, makes no guarantees of a streamlined review process for any design submittal. Submittal review times may be reduced or extended as mutually agreed upon for simple or complex submittals. The Department does not control and therefore cannot guarantee the review times by third parties.

Design submittals

Concept Design (30%) Submittal

The Design-Builder shall provide Concept Design (30%) Submittal as described in other sections of Book 2. At a minimum, the Design-Builder shall provide project geometrics and road typical sections for the Department's approval.

Intermediate Design (65%) Submittal

The Intermediate Design Submittal shall be prepared and submitted to the Department when the design for a given element or area that is intended to be released for construction is 65-percent complete. The Intermediate Design Submittal shall include a complete set of draft plans sheets, all applicable draft specifications and special provisions, technical memos, reports, studies, checked calculations, draft final foundation and geotechnical reports, and other pertinent data, as applicable. The Intermediate Design Submittal shall include details of how the Department's comments resulting from the Concept Design Submittal have been addressed. Additional details of the Submittal are described in other sections of Book 2.

Final Design (100%) Submittal

The Final Design Submittal shall be prepared and submitted to the Department when the design for a given element or area that is intended to be released for construction is 100-percent complete. The Final Design Submittal shall include a complete set of plans sheets, specifications and special provisions, technical memos, reports, studies, checked calculations, independent check calculations, final foundation and geotechnical reports, final Log of Test Borings, and other pertinent data, as applicable to the Work that will be constructed. The Final Design Submittal shall include details of how the Department's comments resulting from the Intermediate Design Submittal have been addressed. Additional details of the Submittal are described in other sections of Book 2.

Released for Construction Submittals

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

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

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

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

Re-submittal Process

Re-submittals of any design submittal may be required if deemed necessary by the Design Quality Manager or the Department. Each re-submittal must address all comments received from a prior submittal in a manner satisfactory to the commenting party. The Design-Builder shall not be entitled to any additional compensation or time extension due to any re-submittal requirement by the Design Quality Manager's review process or the Department.

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

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

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

Concurrent Submittals

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

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

Design Plans	2
Structure Plans	2
Visual Quality Concepts and 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.

2.4.2.3.5 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 Inspection and Testing Plan in the Quality Manual Template, Vol. II. The Design-Builder shall tailor the Inspection and Testing Plan to meet the Project requirements.

Inspection and Testing Plan

The Inspection and Testing Plan shall:

- Describe all of the incoming, in-process, and final inspections and tests to be undertaken.
- Show what products or services are to be subcontracted.
- Be 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 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 and shall contain a written sign-off form for this activity.
- Be approved by the Quality Manager.

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

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

- The record that documents the results

All material tests shall reference the Pay Item #, and sub Item #'s in the Proposal Price Breakdown and corresponding schedule activity ID if applicable. .

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

Materials Control Schedule

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

The Design-Builder shall review the MCS for areas where inspection or testing is not addressed or the Design-Builder desires an increased rate of inspection or testing. The MCS has been reviewed and approved by the Federal Highway Administration (FHWA), so any recommended changes by the Design-Builder will require Approval from 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 Assurance reviews for the Project.
- Ensuring the Materials Certification for the Project is completed and all issues properly addressed.
- Ensuring proper completion of all sample cards and all necessary tests are completed on the sampled materials.
- Coordinating the MCS requirements with all Suppliers and Subcontractors.

The Department has the authority to take samples for acceptance testing and independent assurance sampling testing. The material sample shall be submitted to the Materials Control Schedule Coordinator for delivery and testing.

The Design-Builder shall provide all applicable testing and inspection data, by noon of the following day... 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 assurance team shall conduct quality assurance inspection that include, but is 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.
- Leading 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 shall share quantities, as requested, for verification of testing rates (in accordance with the Materials Control Schedule) with both their quality staff and the Department's staff on the Project.

2.4.2.3.6 Quality Manual – Document and Data Control

General

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

The Design-Builder's Document Management Plan shall:

- Describe the Design-Builder's document control system (DCS) to store and record all documents, correspondence, design inputs, drawings, progress reports, technical reports, specifications, Contract Documents, submittals, calculations, test results, inspection reports, nonconformance reports, administrative documents, and other documents generated under the Contract. This includes all hardcopy and electronic records.
- Identify how records are to be maintained and kept throughout the duration of the Project.
- Describe the methods by which all documents issued and received by the Design-Builder will be logged, tracked, and retrieved.
- Identify how all documents will be tracked using a unique document control number.

Document Submittals to Department

The Design-Builder shall furnish hardcopies of all Project deliverables to 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 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 Department Role

2.4.2.4.1 General

The Department will perform Contract Acceptance and Independent Quality Assurance (IQA) activities: all systematic audits, monitoring and evaluation of various aspects of the Project to ensure the standards of quality are being met, and that all materials incorporated into the work, all equipment, and all elements of the work will perform satisfactorily. There are three primary roles:

- Design auditing will be performed on the products of design (drawings, design and check 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.
- The Department will perform construction acceptance inspection and testing and independent quality assurance sampling and testing. Department will inspect and test to provide formal acceptance of Work at critical construction activity hold points. The Department will also perform Source Inspection of selected materials incorporated in the Work.
- Management Program auditing will be performed on the implementation of the Design-Builder's management plans and Quality Manual. These audits will be systematic and independent examinations to determine whether quality activities and related results comply with planned quality activities and expected results and whether they are implemented effectively and are suitable to achieve objectives.
- Each organization (i.e., Design-Builder, Subcontractor, Supplier, etc.) will be subject to periodic management system audits.

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

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

2.4.2.4.2 Access and Testing

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

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

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

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

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

The Design-Builder shall, within five Days of the identification of a construction-related non-conformance(s) by 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 Department.

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

2.4.2.6.2 Corrective and Preventive Action

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

2.4.2.7 Internal Quality Audits

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

2.4.2.8 Software

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

2.4.3 Deliverables

2.4.3.1 Final Quality Manual

2.4.3.1.1 Submittal and Approval

The Design-Builder shall submit six individually bound hardcopies and one electronic version on CD-ROM of the Quality Manual (Vol. I – IV) for the Department Approval within 30 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 Calendar 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 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 four hardcopies of all Released for Construction Documents. The Design-Builder shall create electronic PDF versions of all hardcopies and upload them into DCS.

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

- MicroStation and/or CAiCE files, including all drawings and data files used to create the RFC Documents.
- 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 CADD Users Manual). 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)
- Design Lead Engineer – Structures (Engineer of Record)
- Safety Manager
- Right of Way, Utility, Railroad, and Permitting Coordinator
- Design Quality Manager
- Construction Quality Manager
- Environmental Compliance 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.
- Shall have:.
    - Fifteen years (15) experience managing complex infrastructure projects
    - Ten years (10) experience managing the design and construction of major urban freeway projects

- Five years (5) of project management experience in design-build on major urban freeway projects
- 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 to develop and implement the DB Design and Construction Quality Control/Assurance Program. The Quality Manager has the ultimate responsibility to ensure that all quality activities conform to the contract documents for quality and testing requirements. This person has the authority to stop any and all work including construction that does not meet the standards, specifications, or criteria established for the Project. The Quality Manager must not be assigned in any other duties or responsibilities on the production side of the Project.
- Must have recent experience in quality management of design and construction of projects similar in scope and complexity.
- Must have fifteen (15) years of experience managing complex infrastructure projects and five (5) years of major design-build construction management of major urban freeways.
- License as a Professional Civil Engineer in California is preferred but not required.

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 Department within 24 hours whenever design activities are being performed, including design activities related to field design changes.
- Shall work under the direct supervision of the Design-Builder's Project Manager.
- Shall be a licensed Professional Engineer in the State of California now or by the time the first Notice to Proceed is issued.
- Shall have:
  - At least five (5) years or preferred 10 years of recent experience in managing the design of highway projects similar in scope and complexity.
  - Fifteen (15) years of experience managing complex infrastructure projects
  - Ten (10) years of experience in managing the design of major urban freeways
  - Five (5) years of major design-build project management of major urban freeway systems
  - Must be a registered Professional Civil Engineer in the State of California now or by the time the initial notice to proceed is issued
  - License as a Professional Civil Engineer in California is preferred but not required.

Construction Manager

- Reports directly to the DB Project Manager and is responsible for ensuring that the project is constructed in accordance with the design and project requirements. The Construction Manager must be present at the site of work at all times when construction is in progress and has the authority to stop work.
- Shall have :
  - Fifteen (15) years of experience managing complex infrastructure projects,

- Ten (10 years of experience managing the construction of major urban freeway systems, and
- Five (5) years of major design-build construction management of major urban freeways.

Design Lead Engineer – Roadway (Engineer of Record)

- Reports directly to the DB Design Manager and will be the Engineer of Record for the Roadway Design.
- Responsible for ensuring that the roadway design is completed and Department criteria are met.
- Must be present at all review and design coordination meetings.
- Minimum of ten (10) years of recent experience in the design of roadways in major urban freeway systems similar in scope and complexity.
- Minimum of ten (10) years of recent experience as Engineer of Record and in design of roadways on the California State Highway System
- Must have a license as a Professional Civil Engineer in California.

Design Lead Engineer – Structures (Engineer of Record)

- Reports directly to the DB Design Manager and will be the Engineer of Record for all Structure Design.
- Responsible for ensuring that the structure design is completed and Department design criteria are met.
- Must be present at all review and design coordination meetings.
- Shall have:
  - Minimum of ten (10) years experience in the design of large complex bridge structures
  - Ten (10) years experience in the design of bridge structures on the California State Highway System and
  - Ten (10) years experience as the lead designer of new/widening of long-span bridge structures similar in scope and complexity.
- Must have a license as a Professional Civil Engineer in California.

Safety Manager

- Must not be under the direct supervision of construction personnel and will report directly to Design-Builder's Project Manager.
- Shall be assigned to the Project full time and be available for the duration of the Project.
- Shall have the authority to stop any and all Work when unsafe conditions are present.
- Shall have Fifteen (15) years experience managing complex infrastructure projects
- Five (5) years of major construction management of major urban freeways
- Must be familiar with FHWA work zone safety regulations and must have at least ten (10) years of recent experience working in roadway work zone safety and OSHA (Cal-OSHA) regulations.

Right of Way, Utility, Railroad, and Permitting Coordinator

- Works directly for the Design Builder.

- Responsible for coordination of right of way, utilities, railroad, and permitting requirements for the Design Builder and for ensuring that right of way, utilities, railroad, and permitting issues are resolved prior to construction.
- Shall be responsible for the design and construction of the Utilities defined as the Design-Builder's responsibility in the RFP and for coordinating the design and construction of Utilities with other Utility Owners.
- Shall serve as the main point of contact on matters of public and private Utilities.
- Shall serve as the main point of contact on all matters relating to railroad.
- Shall have five (5) years of experience with complex infrastructure projects with direct management of right of way functions.
- Shall have five (5) years of management of right of way functions on major urban freeways
- Shall be a licensed Professional Engineer in the State of California now or by the time the first Notice to Proceed is issued.
- Shall report to the Design Manager.
- Must show relevant experience with utility coordination and construction for a similar project.
- Must have experience coordinating with various Railroad entities.

Design Quality Manager

- Shall report directly to the Design-Builder's Executive Management Committee
- Shall be a licensed Professional Engineer in the State of California now or by the time the first Notice to Proceed is issued.
- Shall have responsibility for design quality management including overseeing the day-to-day quality aspects of design.
- Shall be responsible for implementing design related quality planning and training, as well as providing continuous improvement of the Quality Management System.
- Must demonstrate experience checking plans, calculations, drawings, and other design documents to ensure that they are independently checked.
- The Design Quality Manager and Construction Quality Manager shall be different people.
- Shall not be assigned any other duties or responsibilities on the Project.
- Shall have five (5) years of experience as a design quality assurance manager on a project of similar scope and complexity. s.

Construction Quality Manager

- Shall be responsible for overseeing the day-to-day quality aspect of construction including managing the Design-Builder's workmanship inspections, overseeing Design-Builder's production testing, and coordinating with the Department's verification testing and inspection.
- Shall ensure that all testers have current certifications for the tests they are performing, that all on and off-site field labs have current certifications and that materials incorporated into the work meet the requirements of the contract documents.
- The Design Quality Manager and Construction Quality Manager shall be different people.
- Shall report directly to the Design-Builder's Executive Management Committee.
- Shall be assigned full-time to the Project and be on Site during regular business hours whenever any Work is being performed and be available to be on Site within two hours outside of regular business hours.
- Shall not have any production-related responsibilities.

- Shall have the authority to stop any and all Work that does not meet the Contract requirements.
- Shall have five (5) years experience as a Construction Quality Manager on a project of similar scope and complexity.

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 can not 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 $100,000.

The Design-Builder will be assessed a monetary deduction of $25,000 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:

- Quality Manager
- Design Manager
- Construction Manager
- Design Lead Engineer – Roadway (Engineer of Record)
- Design Lead Engineer – Structures (Engineer of Record)
- Safety Manager
- Right of Way, Utility, Railroad, and Permitting Coordinator
- Design Quality Manager
- Construction Quality 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

2.5.2.3.1 General Provisions

For this Project, Co-located facilities will be required. The Design-Builder shall provide or arrange for the use of meeting space for regularly scheduled Project meetings. The Design-Builder shall provide office space and high speed internet connections for the use of up to thirty (30) the Department personnel in the Co-located office facilities approved for the Project.

2.5.2.3.2 Location

Location of the Co-located office will be as determined by the Design-Builder, and concurred by the Department and within five miles of the Project limits.

2.5.2.3.3 [NOT USED]

2.5.2.3.4 Co-located Facilities and Space Requirements – Co-located Office and Laboratory

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

- The Field Laboratory shall be a minimum of 200 square feet and include a lock box.
- The Design-Builder shall provide an exterior storage facility adjacent to the office structure that is a minimum of 100 square feet. The facility shall be for the exclusive use of the Department to store its testing equipment and testing supplies. This facility must be lockable, accessible by vehicles via an all-weather surface and must be substantially constructed as necessary to meet all requirements for storing nuclear test devices.
- The Departments portion of the Co-located Office shall be a minimum of 5500square feet and include the following, at a minimum:
  - Three manager's offices, five lead workers offices, and meeting, file, and drafting rooms.
  - One desk calculator having a minimum of 10 digits for print/display.
  - Locking file drawers.
  - Fax machine that includes a 30-page auto document feeder, transmission speed of 15 seconds per page, a minimum of 10 pages of memory, and a telephone hand set with fax/phone switching.
  - The phone service shall also include a digital, time stamp telephone answering machine and caller I.D. service, and twenty-four (24) telephones with service.
  - T1 lines for high speed internet access, and server cabinet/ room. .
  - One dry tone copy/scanner machine capable of reproducing 8.5-inch by 11-inch and 11-inch by 17-inch sheets of paper with an automatic paper feed. The Design-Builder shall provide for a contract maintenance agreement of the copy machine for the life of the Contract. The copier shall be capable of 10 pages per minute output minimum with a document feeder capable of 99 pages or greater.
  - Meeting office tables with adequate supply of chairs for all participants at Project meetings.
  - One hot and cold water dispenser complete with cups and drinkable water supply always on hand.
  - One full size refrigerator/freezer.
  - One 1100-watt microwave oven.
  - One first aid kit with eye wash station.
  - Men and women toilet and washing facilities with supplies.

2.5.2.3.5 Computer Equipment

Two PC desk top computer with flat screen monitor, key board, and mouse capable of running CPM scheduling software.

Two stand alone PC color printers capable of being networked and producing 8.5 inch by 11 inch, and 11 inch by 17 inch color prints and supplies. A 48" Plotter capable of printing CPM schedules and profiles with 42" and 36" paper rolls and plotter supplies to be returned by the final estimate.

2.5.3 Deliverables

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

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

2.6 Safety Management

2.6.1 General

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

2.6.2 Administrative Requirements

2.6.2.1 Design-Builder Safety Management Plan

The Design-Builder shall develop, implement, and maintain a written Safety Management Plan that describes the processes to be followed to ensure the Department, Public, and Worker Safety for the Project. .

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

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

1. Be consistent with the Project insurance requirements.
2. Describe the participation of safety personnel in all Work activities.
3. Delineate administrative responsibilities for implementing the Safety Program.
4. Identify responsibilities and accountability.
5. Identify full-time dedicated safety professionals or managers covering all production shifts.
6. Describe the process of conducting safety orientation for all employees. The description of the safety orientation process shall include the following:
   a. A description of the extent and nature of the Project
   b. A description of any hazards that can typically be expected during the course of Work that is specific to the job assignment
   c. Required Work practices, job conduct, and injury-reporting procedures
   d. Any other general information to acquaint the employee with special Work and safety requirements at the Work Site
7. Describe the Design-Builder's drug policy, including the policy at the Work Site and any pre-job Site and post-incident drug testing to satisfy Project insurance requirements.
8. Describe employee-training requirements.
9. Describe safety inspection procedures of Work areas, materials, and equipment to ensure compliance with the Safety Program; methods of record keeping; and correction of deficiencies.
10. Describe incident and emergency response procedures for land based and river based incidents, including response capabilities, evacuation and egress, responsibilities for reporting and investigating incidents, exposures, contingency plans, and the maintenance of safety-related logs.
11. Describe incident reporting procedures.

12. Describe the Design-Builder's Work Site control policy and plans for maintaining Site cleanup, on-Site first aid facilities or medical clinic, and safe access.
13. Identify public safety requirements (e.g., fencing, signs, and barricades).
14. Describe the Design-Builder's hazard communication program.
15. Describe the process of including representatives from the Design-Builder and all major Subcontractors, as well as the Department personnel working on the Project.
16. Describe the Design-Builder's method of tracking open safety issues.
17. Describe hazard analysis, tracking, and reduction of risk, logs, and mapping procedures.
18. Describe the Design-Builder's management and auditing of the Safety Management Plan.
19. Describe personal protective equipment (PPE) requirements and policy.
20. Describe safety procedures for Design-Builder's employees working around and handling contaminated materials.

2.6.3 [NOT USED]

2.6.4 Construction Requirements

It is the Design-Builder's responsibility to provide for the safety of traffic and the public during construction. All Work under this Contract shall comply with all applicable Occupational Safety and Health requirements, standards, rules and orders established by the California Division of Occupational Safety and Health Construction Safety Orders, as well as other applicable Federal, State, and local laws. The Design-Builder shall not require any laborer or mechanic to Work in surroundings or under working conditions that are unsanitary, hazardous, or dangerous to his/her health and safety as determined under construction safety and health standards promulgated by the U.S. Secretary of Labor.

2.6.5 Deliverables

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

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

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

EXHIBIT 2-A

Quality Manual Template

This exhibit is provided as an electronic file.

3 PUBLIC INFORMATION

3.1 General

The Design-Builder shall perform all Work necessary to meet the requirements associated with public information in accordance with the requirements of the contract documents and these Technical Provisions.

3.2 Administrative Requirements

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

3.2.1 Standards

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 PIP shall incorporate communications processes defined throughout Section 3 and those required in other functional areas, such as determining the construction and noise impacts on local residents and businesses.) The Design-Builder shall develop the PIP consistent with Department's Media Policies attached in Exhibit 3-A . The Design-Builder shall serve as a facilitator to address public information issues and shall be proactive in providing information and responding to the public. The Design-Builder shall maintain an open line of communication with the Department's Public Information Office (PIO) or assigned Public Information Officer on matters of review and comment on all work produced on behalf of the Department.

The Design Builder will not represent the Department in any way through the media. All calls and inquiries are to be sent to the Department's local PIO.

The Design-Builder's public information staff shall be accessible 24 hours a Day, seven Days a week, and shall respond within two hours of contact to address Project issues (except in cases of emergency situations, in which case response shall be within 15 minutes). The Design-Builder's public information staff shall

provide contact information, including home, fax, mobile, , e-mail list of employees assigned to the Project to the Department within ten Days of NTP1. The Design-Builder's public information staff shall hold coordination meetings as necessary or at the request (or as jointly deemed necessary) with the Department. Steps shall be taken to reduce the cost of meeting, by using alternate means of meeting (conference calls, video conference or the like)

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

The Design-Builder shall use the Public Information Plan as the framework for disseminating and responding to information from the public. The Design-Builder shall become aware of and comply with the Departments Directive DD-79-R1 California Public Records Act guidelines throughout the Project. (Exhibit 3-B).

3.2.3 Customer Groups (Audiences)

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

- Area residents
- Property owners
- Commuters
- The traveling public
- Commercial vehicle operators
- City, County and regional government officials
- City Chamber of Commerce
- Advisory Committee
- State legislators
- Department employees
- School district transportation agencies/charter companies
- Business owners, employees, and customers
- Neighborhood and business associations
- Railroad Agencies
- Federal Agencies (e.g. Federal Aviation Administration and United States Marine Corp)
- News media, specifically the *San Diego Union*
- Emergency response agencies, including police, fire, and ambulance agencies
- Local Hospitals
- County Sheriff
- Utility Agencies
- Local community organizations
- Historic Preservation Office
- Local tourist destinations
- Local delivery and courier services
- School districts

- Local Colleges
- Water management organizations, environmental permitting agencies, and other local service districts

3.2.4 Crisis Communications

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

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

3.2.5 Data Collection and Management

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

The Design-Builder's data collection and management approach shall account for the ongoing information needs of various customers. For example, residents, commuters, and most other customers will need information about the construction schedule and what roads will be affected and/or closed by construction. Likewise, commercial vehicle operators will need specific information on any conditions that would restrict or prevent commercial vehicles from using roadways under construction. Emergency response providers shall be notified by the Design-Builder if designated routes for emergency vehicles are altered. All Project customers and stakeholders will require reliable, accurate, accessible, and timely information on when and where construction is taking place.

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

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

3.2.5.1 Construction Activities and Maintenance of Traffic Information

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

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

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

In addition:

- Information gathered by the Design-Builder shall be reviewed for accuracy and forwarded as soon as it becomes available (within a maximum of two hours) to the Department.
- Information gathered by the Design-Builder shall be posted on the Project's public Web site no later than two hours after it becomes available.
- The Design-Builder shall work with the Department to coordinate and develop the technical interfaces between the Project's public Web site, the construction information recorded, and any other relevant information dissemination systems identified by the Design-Builder and/or the Department.
- Changes in information gathered by the Design-Builder shall be posted immediately by the Design-Builder to the Project's public Web site as described in Section 3.2.7.2.1.
- The Design-Builder shall coordinate the dissemination of information (construction, commercial vehicle, incident, etc.) with Department's PIO, 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, post the information on the Web site, and disseminate it through other technologies.
- All information shall be verified for accuracy before release with PM, RE, and PIO.

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

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

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

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

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

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
- Potential impacts
- Contact information
- Phone numbers
- Website
- The start of the activity
- The end of the activity

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

3.2.5.1.2 Maintenance of Traffic and Access

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

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

- Residents and businesses affected
- Alternate routes and detours
- A contact for further information

3.2.5.1.3 Traffic Conditions

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

3.2.5.1.4 Commercial Vehicle Access and Restriction Information

A written schedule shall be submitted not less than twenty five (25) Calendar Days and not more than 125 Calendar 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 to the Departments Construction Manager, California Highway Patrol, Department's Office of Truck Services (Transportation Permits), and Department's Project Manager with notice including:

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

3.2.5.1.5 Emergency Services Vehicle Access

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

3.2.5.1.6 Changes to Access

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

3.2.5.1.7 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, 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 of San Diego.

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

3.2.5.1.9 Incident Information

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

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

3.2.5.1.10 Events

The Design-Builder shall compile a weekly listing of special events in the Project area that may be affected by the Work. The Design-Builder shall coordinate, communicate, and provide a plan to minimize conflicts for public events held by public and private entities (Examples include city festivals, parades, and sport events.) and schedule and conduct Work to avoid unnecessary inconvenience to the public and abutting property owners in accordance with Section 7-1.08 of the Standard Specifications. The Design-Builder shall notify the Department of planned events that may be affected by construction a minimum of 14 calendar Days before each event takes place. The Department PIO will provide updated general event schedule quarterly to the Project Managers.

3.2.5.1.11 Nighttime Construction Noise

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

3.2.6 Methods of Disseminating Information

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

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

3.2.6.1 Communications Matrix

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

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

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

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

3.2.6.2 Public Contact

The Design-Builder shall work with the Department's PIO 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.

Design Builder will coordinate with the Department to develop a list of the names and addresses of many residents and businesses located in the Project area. Contacts that may have already 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 or as jointly deemed necessary.

3.2.6.4 Media Relations

When media relations efforts are required by the project as determined by the Department, media relation shall be managed by the Design-Builder with direction and support from Department's District 11's PIO. The Department will be responsible for conveying Vision messages (as described in Section 3.2) to the media and addressing Project-specific Progress (see Section 3.2) questions such as budget, milestones, etc. The Department and the Design-Builder shall work together to develop key talking points and to convey Coping messages (see Section 3.2), such as day-to-day lane closures, and specific phasing questions.

During the Work, the Design-Builder shall immediately notify the Department of any situations involving the media, and all communications requests shall be tracked by the Department. The Design-Builder shall become familiar with the Department media policies included in Exhibits 3-A. This policy outlines expected Design-Builder behavior when contacted by media representatives.

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

3.2.6.5 Community and Business Relations

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

3.2.6.6 Government Affairs

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

3.2.6.7 Information Service Providers

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

3.2.6.8 Project Identity

The Design-Builder shall support the Department in efforts to provide key educational messages and to build awareness about the Project. The Department has created a project identity, or "brand," that will allow the various entities of the Project team to present Project information seamlessly to the public. The Design-Builder shall use the Department logo, as well as the Project name, to identify itself as part of the Project team and in its communication vehicles to the public. The goal is to eliminate individualism and to portray all communications about the Project as a partnership between the Department and the Design-Builder. Approval of all Project identity and brand materials will be a cooperative effort between the Design-Builder 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, the Department, SANDAG, and the City of San Diego. 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 511 Roadway Information System.

3.2.7.2.1 Web Site

With oversight by the Department and using the Department Project Web site template, the Design-Builder shall maintain the Project's public Web site (http://onramp.dot.ca.gov, and http://www.dot.ca.gov, located on a Department project Web server) 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 a format for displaying information with the Department's PIO concurrence.

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, a designated City of San Diegorepresentative, and the Design-Builder's Project Manager shall be included on the telephone tree for notification of any emergency that may surface.

3.2.7.3.1 List of Emergency Service Providers

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

3.2.7.4 Public Meetings and Personal Contact

3.2.7.4.1 Public Information Meetings and Open Houses

The Design-Builder shall conduct construction meetings as needed in a convenient location for community members in active Project areas when determined by the Design-Builder and the Department. Participants shall include the Design-Builder's Project Manager, the Department Contract Manager, and a designated City of San Diego representative. Local participants shown above in 3.2.3 are expected to attend. The Design-builder will provide the local meeting facility with the Departments concurrence. The purpose of these meetings shall be to update affected parties, resolve complaints, etc. The Design-Builder's management and public information teams and the Department shall attend all meetings. The Design-Builder shall organize and arrange all Project meetings and extend invitations to appropriate participants as agreed by the Department. The Design-Builder's Project Manager and other Design-Builder-selected personnel shall meet

with the Department Project Manager and a designated City of San Diego representative at a mutually agreed upon location at least three (3) days in advance of the planned public construction meeting. .

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

3.2.7.4.2 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 seven 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 and the Department's CPRA Coordinator. When appropriate, this information shall be furnished via an FTP site or may be disseminated in both paper and electronic format.

3.2.7.5 Information Materials

The Design-Builder, in coordination with Department's PIO, shall prepare information materials for any business, resident, news media outlet, or others to support its communication 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 Department.

EXHIBIT 3-A

The Department Media Policies

As stated in the following seven Directives

3-A1	DD-19R2	Media Relations/Public Information (Word)
3-A2	DD-20	Public/Private Partnerships to Provide Public Use Infrastructure (PDF)
3-A3	DD-27R1	Caltrans Publications (Word)
3-A4	DD-33	Department Signature (PDF)
3-A5	DD-46	External Advisory Committees (PDF)
3-A6	DD-79	Public Records Act Requests (Word)
3-A7	DD-83	Project Purpose & Need (Word)

. This document is provided as an electronic file, and is available on the Departments website;

http://onramp.dot.ca.gov/hq/paffairs/ExternalAffairsPoliciesDirectives.html

EXHIBIT 3-B

Department California Public Records Act Guidelines

This document is provided as an electronic file, and is available on the Departments website;

http://www.dot.ca.gov/cpra/

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 as well as any State and Federal laws.

4.2 Administrative Requirements

4.2.1 Standards

The Design Builder shall perform 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 Request for Proposals (RFP) issue date unless specified herein or modified by Addendum or Change Order.

Environmental Standards and Requirements Priority Agency Title

Priority	Agency	Title
1	Caltrans	Exhibit 4- A, MND/*FONSI*
2	Caltrans	Environmental Commitment Record
3	Caltrans	Exhibit B, Department-Obtained Permits, Agreements and/or Approvals
4	Caltrans	Standard Environmental Reference
5	Caltrans	Special Provisions
5	Caltrans	Standard Plans May 2006
6	Caltrans	Design Build Modifications to the Standard Specifications
7	Caltrans	Standard Specifications May 2006
8	Caltrans	Construction Site Best Management Practices (BMPs) Manual
9	Caltrans	Storm Water Pollution Prevention Plan (SWPPP) and Water Pollution Control Program (WPCP) Preparation Manual
10	Various	Technical Memoranda
11	RWQCB	SUSMP Requirements
12	Caltrans	Volume II, CT Environmental Handbook; Cultural Resources
13	Caltrans	Volume III, CT Environmental Handbook; Biological Resources
14	Caltrans	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**
Caltrans	Surveys Manual
Caltrans	Ready-To-List and Construction Contract Award Guide (RTL Guide)
Caltrans	Construction Manual
Caltrans	California Test Methods
U.S. ACE	*Wetlands Delineation Manual*

4.2.2 Permits

Permits provided by the 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 both the Department and the Design Builder. Table 4-1 should be amended accordingly.

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

Table 4-1: Project Environmental Permit, Agreement, and/or Approval Responsibilities

REQUIRED PERMITS, AGREEMENTS, & Approvals	**N/A**	**COORDINATE**	**PREPARE APPLICATION**	**OBTAIN**	**IMPLEMENT**	**RENEW**	**AMEND**
404 USACOE		CT	CT	CT	CT/DB	CT	CT
401 RWQCB		CT	CT	CT	CT/DB	CT	CT
NPDES SWRCB							
State Waste Discharge Requirements (Porter Cologne) RWQCB							
FESA Section 7 USFWS		**CT**		**CT**		**CT**	**CT**
Coastal Development Permit		CT	CT	CT	DB	CT	CT
BCDC Permit							
1602 CDFG		CT	CT	CT	CT/DB	CT	CT

Air Quality Permits							
Other (specify)							

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

4.2.3. Process

Environmental Compliance Manager shall review design packages prior to submittal to the Department to determine whether proposed work is within the scope of the existing Environmental Document (ED) and resource agency permits and agreements.

Each Design submittal shall contain a signature of the Environmental Compliance Manager indicating that an environmental review has been performed and conforms to the scope as indicated in the ED and resource agency permits and agreements.

If it is determined by the Environmental Compliance Manager that the submittal does not conform to the scope as indicated in the Environmental Document and/or resource agency permits and agreements, the Environmental Compliance Manager will be responsible for notifying the Department of differences in the submittal through a standardized format agreed upon by the Department and Environmental Compliance Manager. Within 15 day, the Department Contract Manager will notify the Environmental Compliance Manager whether the documentation is sufficient or whether the Environmental Compliance Manager will be required to prepare an environmental reevaluation per the Caltrans Standard Environmental Reference (SER). If it is determined by the Department that the work is not within the scope of the ED and/or resource agency permits and agreements, work specified in the design package may not be performed until documentation or a reevaluation is completed in compliance with the SER and State and Federal Laws and/or resource agency permits and agreements are amended.

Prior to approval of design submittals, the Department shall provide concurrence on the Environmental Compliance Manager's documentation. If additional work is required, or additional documentation is requested, the Environmental Compliance Manager will provide additional materials restarting the 15 day review period.

Environmental Compliance Manager will be responsible for tracking environmental commitments as specified in the ED and for tracking compliance of each commitment through the Environmental Commitment Record (ECR). The Environmental Compliance Manager will update the ECR as part of the reevaluation process as conditions change and as directed by Department Environmental staff.

4.2.4 Environmental Management Plan

The Design Builder shall submit an Environmental Management Plan (EMP) that describes the Design Builder's approach, based on the ECR and all applicable permits, biological opinion, etc. for mitigating environmental impacts and containing the following elements:

• Environmental personnel and training

• Environmental Commitment Record (ECR)

• Weekly and monthly reporting

• 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 Compliance Plan for ADL and Paint Stripe Removal

• 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 by the Department..

4.2.4.1 Environmental Personnel and Training

4.2.4.1.1 Environmental Personnel

The Design Builder shall designate an Environmental Team that consists of those persons responsible for compliance with all permits, 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 Qualified Stormwater Developer (QSD) and Qualified Stormwater Practitioner (QSP) that has the qualifications provided in the Construction General Permit (CGP), Caltrans Standard Special Provisions, current Storm Water Quality Handbooks, Storm Water Pollution Prevention Plan (SWPPP) and Water Pollution Control Program (WPCP) Preparation Manual. The Design Builder's

QSD and QSP shall be responsible for preparation and compliance with the CGP and the Caltrans NPDES Permit.

Certified Erosion and Sediment Control Supervisor

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

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

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

Installer

At least one certified installer at the time of installation shall be required for the following erosion control activities: seeding, sodding, mulching, silt fence or other perimeter sediment control device installations, erosion control blanket installation, hydraulic soil stabilizer installation, silt curtain installation, ditch check installation, storm drain inlet protection, riprap placement, compost installation, and erosion stabilization mat installation.

4.2.4.1.2 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 WPCP/SWPPP including the functions and proper installation of Best Management Practices (BMPs) to be implemented
- Proper procedures for spill containment
- Proper and safe handling of contaminated soil and groundwater

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

The Design Builder shall include a schedule for implementation of the environmental protection-training program. 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.

4.2.5 Coordination with Other Agencies and Disciplines

The Department will coordinate and resolve 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.

4.2.6 Certification Requirements

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

4.2.7 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.

4.2.8 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.

4.4 Construction Requirements

4.4.1 Mitigation Measures

The 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, permit 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.

The Design Builder is responsible for the protection of Environmentally Sensitive Areas (ESAs), notwithstanding the oversight role of the Department. The Project may be subject to inspections from the California Department of Fish and Game (CDFG), United States Fish and Wildlife Service (USFWS), United States Army Corps of Engineers, Regional Water Quality Control Board (RWQCB), and the Department.

The Design Builder shall follow the terms and conditions of the Environmental Comments Record(ECR) and all permit(s) pertaining to requirements for the protection or mitigation of impacts on ESAs.

ESAs include cultural and biological resources as defined in the FED, as well as those discovered during the preconstruction survey(s) process. No construction activity shall affect the ESAs without approval of the appropriate permitting agency and the Department.

Identified ESAs are to be included in the Environmental Commitment Record and is to be shown on the project plans. Protection of the ESA shall be facilitated by identification of the Site location using fencing, as appropriate.

Environmental training of all construction workers shall include the importance of ESA protection, visual recognition through fencing, and potential project and personal liabilities resulting from ESA damage/impact. Design Builder shall assure inspection of the ESA in accordance with the ECR and immediately report any damage/impact to the Department.

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 extent the project beyond the limits identified on the Area of Potential Effect (APE) map shall be reviewed by 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 Design Builder 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 Federal, State, and Local regulations..

Asbestos in Bridge Structures

Asbestos was found in all five of the bridges sampled within the project limits. Information can be found in "Limited Asbestos Survey Report" by Kleinfelder dated June 23, 2009.

The Design Builder shall provide complete assessments, oversight, and abatement of asbestos-containing materials, and complete removal of regulated wastes prior to demolition. The Design Builder shall provide notification a minimum of twenty-four (24) hours prior to starting work and twenty-four (24) hours prior to completion of all work.

Payment for asbestos and lead containing materials generated from demolition shall be based on quantities and unit prices in Table 1 attached herein.

The Design Builder shall abate all hazardous materials to include but not limited to friable and anon-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 14 calendar days prior to start of any demolition 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 have access to the "Limited Asbestos Survey Report" by Kleinfelder dated June 23, 2009, and have the appropriate SSP's 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.

Payment for asbestos and lead containing materials generated from construction activities shall be based on quantities and unit prices in Table 2 attached herein.

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 to DTSC.

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.

Payment for asbestos and lead containing materials generated from construction activities shall be based on quantities and unit prices in Table 2 attached herein.

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 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 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 adhere to the General Waste Discharge Requirements for Discharges from Groundwater Extraction and Similar Discharges to Surface Water Within the San Diego Region Except for

San Diego Bay, Order No. R9-2008-0002, NPDES No. CAG919002 (Dewatering Permit). The Dewatering Permit is to be obtained when groundwater is discharged into surface waters.

For all Project dewatering, the requirements of the Dewatering Permit and Construction General Permit (CGP) shall be used. The Design Builder shall provide access to all active discharge points.

Ground Water Quality

If the Design Builder chooses to dewater during construction at any location along the project, ground water samples shall be collected and analyzed for contaminants of concern by the Design Builder in accordance with the Dewatering Permit. The Design Builder shall submit a dewatering work plan for approval.

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 three (3) feet of material in unpaved areas within the highway ROW. ADL is present within the planned ROW limits as indicated in the following reports:

1. Aerially Deposited Lead Study Report by Kleinfelder dated January 29, 2009

This report was prepared for the I-805 and represents the sampling taken along I-805 between State Route 52 and the I-5/I-805 merge. For a description of the lead concentrations in the soil refer to Table 2; Summary of 95% UCL's. .

If less than a foot of soil will be removed for the construction of the project then SSP 19-900 shall be used and the soil will be considered type Y1 and the variance will be invoked. If Greater than 1 foot of soil is to be removed for the construction then the soil is considered type X which is non-hazardous, the SSP 15-027 shall be used and the soil can be removed from the site without any restrictions.

If the variance is invoked, the Design Builder shall comply with the Department of Toxic Substances Control's Variance in handling ADL material in the case of Type Y1 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.

If the variance is invoked, 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 Excavation 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.

If the variance is invoked, 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.

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

If the variance is invoked and the Design Builder has completed the permanent placement of material containing aerially deposited lead in conformance with the requirements of the Contract Documents, the Design Builder shall have no further responsibility for such materials in place. The Design Builder will not be considered a generator of such contaminated materials, except as expressly provided in the Contract.

Further cleanup, removal or remedial actions for such materials will not be required if handled or disposed of as specified herein.

4.4.1.3 Noise

Construction Noise

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

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

The noise level from the Design Builder's operations, between the hours of 9:00 p.m. and 7:00 a.m., shall not exceed 86 dBa at a distance of 15 m. This requirement shall not relieve the Design Builder from responsibility for complying with local ordinances regulating noise level.

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

The Design Builder shall submit a Noise Control Plan and a Noise Monitoring Plan, as specified in the Construction Noise and Vibration Control Section of the General Requirements. An Acoustical Engineer meeting the qualifications specified in the General Requirements shall prepare both plans.

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 three months.

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

• Limiting the time and duration of the noisiest nighttime construction activities.

• Implementing methods to reduce pile driving noise levels.

• Constructing temporary noise barriers or curtains around stationary equipment or other noise-producing construction activities that must be located close to residences to decrease noise levels at nearby sensitive receptors.

• Using resilient bed liners in dump trucks to be loaded onsite during nighttime hours.

The Design Builder shall provide at least seven (7) days notice to affected communities for any necessary 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 implement a training program to ensure all employees and Subcontractors are educated as to the construction noise abatement requirements.

Noise Barriers

Prior to construction of noise barriers adjacent to private properties, the Design Builder shall perform an inventory of privately owned trees and other Structures that may be impacted by the construction of the noise barriers. Trees whose drip lines fall within the limits of proposed noise barriers shall be evaluated by a qualified arborist to determine if the construction will have any adverse impacts to the trees. If it is determined that construction may have an adverse impact to the trees, the Design Builder shall provide the information prior to proceeding with the Work in order to determine appropriate mitigation replacement.

The general locations of the noise abatement identified are provided in the Preliminary Engineering Documents, FED or project noise technical reports for the Project in the Reference Documents. Specific lengths and heights of noise barriers and noise berms are provided in the FEID or project noise technical report for the project.

Noise barriers and noise berms shall be constructed at the general locations provided. Noise barriers and noise berms shall be constructed at locations and to lines and grades as shown prior to major construction activity.

The Design Builder shall comply with the requirements concerning architectural treatments for noise barriers.

Traffic Noise

The Design Builder shall be responsible for noise analyses and abatement measures in compliance with the requirements of the FED or project noise technical report and the Contract Documents. Noise analysis and abatement shall be in conformance with all Noise Analysis and Abatement Guidelines. The Design Builder shall use the Traffic Noise Model v2.5, currently approved by FHWA, or the same model used to perform noise analyses within the NEPA phase of the Project. Preliminary noise model data for abatement measures within the project limits and, lengths and heights for noise barriers are provided in the FED or project noise technical report.

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 comply with the following provisions in the 2006 Caltrans Standard Specifications:

- Section 7-1.01F “Air Pollution Control”
- Section 10 “Dust Control”
- Section 17 “Watering”
- Section 18 “Dust Palliative”

The "Measurement" and "Payment" sections of the Sections listed above do not apply. Payment for the work is considered included in the prices paid for the various contract items involving the use of water and no separate payment will be made therefore.

Along with the provisions stated above, the Design Builder shall comply with the following:

- Minimize land disturbance
- Use water trucks to minimize dust; watering should be sufficient to confine dust plumes to the project work areas
- Suspend grading and earth moving when wind gusts exceed 25 miles per hour unless the soil is wet enough to prevent dust plumes
- Cover all trucks hauling dirt when travelling at speeds greater than 15 miles per hour
- Stabilize the surface of dirt piles if not removed within 2 days
- Limit vehicular paths on unpaved surfaces and stabilize any temporary toads
- Minimize unnecessary vehicular and machinery activities
- Sweep paved streets at least once per day where there is evidence of dirt that has been carried on to the roadway
- Revegetate disturbed land, including vehicular paths created during construction to avoid future off-road vehicular activities
- Remove unused material
- Locate construction equipment and truck staging and maintenance areas as far as feasible and minimally downwind of schools, active recreation areas, and other high population density areas

4.4.1.5 Water Quality

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.

For the storm water discharge option, the Design Builder will NOT be allowed to discharge construction wastewater (other than storm water) from the site until the Design Builder files a Notice of Intent (NOI) with the State Water Resources Control Board to comply with the terms of the General Permit to Discharge Storm water associated with construction activity. If Design Builder chooses not to file a NOI, Design Builder must collect truck wash-downs and general construction wastewater (other than storm water and dispose of it off-site. 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, if the Design Builder elects to file an NOI, 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], 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 San Diego 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.

• Prepare and submit a Storm Water Pollution Prevention Plan in accordance with the Construction General Permit for construction discharges, and related federal and state laws and regulations. SWPPP shall be submitted within 30 days of NTP.

• 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 the Dewatering Permit, sample and test effluent quality for those parameters are Design Builder's responsibility. Record daily discharged quantities. Submit certified monthly reports not later than seven days after the end of the month detailing the daily flows and the testing data.

• Design Builder Noncompliance - Design Builder shall bear any fines incurred as a direct result of Design Builder's failure to treat those, herein, parameters that Design Builder is responsible for.

• Do not discharge pollutant wastes such as chemicals, fuels, lubricants, bitumens, raw sewage and other harmful wastes onto the land nor into or alongside rivers, streams and impoundments, nor into gutters, storm drains or channels leading thereto.

• Control use of lubricating oils, hydraulic fluids, greases and other such products. Promptly clean up and properly dispose of materials contaminated by spillage or leakage of products. Comply with storage and containment requirements of these materials in accordance with Federal, State or local Storm Water Permit Regulations.

4.4.1.6 Waters and Wetlands

The Design Builder shall comply with all regulatory requirements related to Waters and Wetlands as stated in the Environmental Document and permits (401 Certification, 404, 1602 Streambed Alteration Agreement and Biological Opinion).

4.4.1.7 Wildlife and Vegetation

The Design Builder shall identify impacts, 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 (ESAs), protection of active bird nests, and control of invasive plant species. The Design Builder shall provide notification if either of the following occurs:

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

• New threatened or endangered species are listed or discovered within the Project area

• Any restriction at 3 wildlife crossings.

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 15 and August 31, 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 August 31.
- 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 or natural science 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. Shaping and reestablishing vegetation are the basic erosion prevention methods.

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

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

4.4.2 Environmental Monitoring and Reporting

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

4.4.2.1 Weekly Reports

The content of the weekly reports shall document evidence of the Design Builder's performance and include the following:

- Name of environmental monitoring inspector
- Date of monitoring
- Weather conditions
    - Location
    - Resource(s) addressed
    - Locations and nature of violations
- Recommended remedial actions

4.4.2.2 Monthly Reports

The Design Builder shall combine the weekly report forms into a document that summarizes the month's environmental monitoring activities and submit for Approval with the monthly Invoice. Failure to do so in

the time specified could result in the progress payment being withheld as the project could be found to not be in environmental compliance.

4.4.3 Environmental Notification Contact List

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

• Include all contact Persons representing the Design Builder, 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 and regulations such as:

- Clean Water Act Section 401—Water Quality Certification

- Clean Water Act Section 402—National Pollutant Discharge Elimination System

- 1602 CDFG Streambed Alteration Agreement –

-Clean Water Act Section 404

USFWS Biological Opinion

- California Rules and Statutes

- Local watershed district or water management organization requirements

• Any pollution issue not covered in items listed above

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

4.4.4 Schedule

The Design Builder shall include with the EMP a schedule of activities for environmental 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

• 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.

• Correspondence file

• All final reports for environmental work

4.5.3 Environmental Monitoring Reports

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

4.5.4 Final Design Documents

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

• Plans

• Shop drawings

• Design calculations

• Reports/Project documentation

• Specifications and Special Provisions

4.5.5 As-Builts Documents

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

4.5.6 Measurement and Payment

All environmental items not specifically identified for payment under Table 1, 2, or 3 attached herein will be paid for as a lump sum for Environmental work, as part of the Contract Price.

EXHIBIT 4-A

Initial Study with Mitigated Negative Declaration/Environmental Assessment with Finding Of No Significant Impact

This exhibit is provided as an electronic file.

EXHIBIT 4-B

Department-Provided Permits

Exhibit 4-B1 Biological Opinion

Exhibit 4-B2 Local Coastal Permit

These exhibits are provided as electronic files.

5 [NOT USED]

6 UTILITIES

6.1 General

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

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

6.1.1 Utility Involvement

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

6.2 Administrative Requirements

6.2.1 Responsibility

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

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

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

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

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

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

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

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

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

6.2.1.1 Design-Builder Responsibilities

6.2.1.1.1 Relocation Communication

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

6.2.1.1.2 Other Design-Builder Requirements

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

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

- Identification and verification of all existing Utilities located within the project limits or otherwise impacted by the Project.
- Upon the Department's request under a specific Work Order, the Design-Builder shall design or/and perform the physical utility relocation.
- The Design-Builder shall inspect and monitor all of the physical relocations. The Design-Builder shall document the progress in detail and provide information to the Department upon request.
- The Design-Builder shall be responsible for Identification, verification, and Approval/Certification that the location of all existing Utilities and the design and construction of proposed Utility Relocations are compatible with the remainder of the Project. Whether the Utility Owner or the Design-Builder performs the Utility Work, the Design-Builder will incorporate this information into the Project plans and provide coordinates, profile information, potholing results that confirm all existing Utilities and conflicts for Utility Relocations, and surveys of pertinent points in the field that show the exact placement of all Utility facilities. The Design-Builder will incorporate this information into its CADD drawings, and ultimately, on the Design-Builder's As-Built Documents. If the Utility Owner performs the design and construction of the Utility Relocation, the design information will meet only the standard of quality necessary for the Utility Owner to construct the Utility Relocation.

The Design-Builder is excluded from the following obligations assigned to the Department:

- Collecting payments due from the Utility Owners and/or reimbursing Utility Owners for their costs of performing Utility Work required under the Notice to Owners.
- Negotiating with Utility Owners to resolve issues relating to the determination of legal responsibility for costs between the Department and the Utility Owner

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

- Whether or not the Utility and/or necessity of the Utility Work was identified before the Proposal Due Date.
- 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 execution of a Work Order or a separate Change Order providing for the Utility Owner or its Design Builder to furnish or perform such Utility Work. If requested by a Utility Owner and approved by the 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 execution of a Work Order or a separate Change Order.

6.2.2 Procedures and Agreements

6.2.2.1 Utilities Identified at the Time of the RFP

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

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

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

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

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

- 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 energized utility facility until arrangements that are satisfactory to the Utility Owner have been made by the Design-Builder for the protection of the Utility and continuation of its service. Should the Design-Builder's equipment come in contact with or damage a Utility in any way, even though there may be no apparent evidence of breakage or harm, the Design-Builder shall promptly notify the proper authorities and cooperate with those authorities in determining damage and restoring interrupted services if needed. Where contact is made with a Utility, the Design-Builder shall suspend operations immediately and vacate the area until it has been determined by the Utility Owner that it is safe to resume operations.

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

6.2.2.1.1 Newly Discovered Utilities

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

6.2.2.1.2 Notice to Owner

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

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

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

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

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

6.2.2.2 Utility Permits and Construction Easements

When the Design-Builder is responsible for performance of the construction of the Utility Work, although it is the responsibility of the Utility Owner to obtain the Department Utility permits, the Design-Builder shall coordinate with the Utility Owner to obtain all construction-related local entity Utility permits, the

Department Utility permits, and/or Construction Easements or agreements. The Design-Builder shall comply with such Utility permits and Construction Easements or agreements. Separate permits may be required for Work on streets under local entity jurisdictions. A Utility permit from the Department is required for any new Utility facility and for Betterments within the Department R/W.

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

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

6.2.2.3 Utility Tracking Report

The Design-Builder shall maintain a Utility Tracking Report in the form attached as Exhibit 6-C that lists all Utilities affected or potentially affected by the Project. The Design-Builder may modify it if Approved by the Department.

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

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

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

6.2.3 Coordination and Cooperation

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

- Provide to the Utility Owner , as soon as practicable, an estimated schedule for their respective Utility Work and notify the Utility Owners of any significant changes to the schedule as soon as practicable;
- Keep Utility Owners fully informed of Project schedules and changes that affect or may affect their Utility facilities;
- Consider Utility Owners' needs for the allocation of resources to perform their Utility Work;

- Keep Utility Owners involved in making the decisions that affect their facilities so Utility Owners are able to provide uninterrupted service to their customers, or be subject to the least interruption practicable; and
- Coordinate the Utility Work to avoid multiple Utility Relocations of the same Utility.

6.2.3.1 Utility Coordination Meetings and Correspondence

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

6.2.3.1.1 Meeting Minutes and Correspondence

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

6.2.3.2 Scheduling

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

6.2.3.3 Cost Estimates

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

6.2.3.4 Overrun of Estimated Cost

6.2.3.4.1 Department Responsible for Payment of Utility Work

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

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

6.2.3.4.2 Utility Owner Responsible for Payment of Utility Work

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

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

6.2.3.5 Notifications

6.2.3.5.1 Coordination with Utility Owners

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

6.2.4 Failure of Utility Owner to Cooperate

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

6.2.5 Standards

In the event of a conflict among the standards set forth in Book 3 relating to Utilities, the order of precedence shall be as set forth below, unless otherwise specified herein or modified by Addendum or Change Order.

Utility Standards and Requirements

Priority	Agency	Title
1	Department	Standard Special Provisions
2	Department	Standard Specifications, May 2006
3	Department	Standard Plans, May 2006
4	Department	Project Development Procedures Manual
5		California Streets and Highways Code
6	Department	Ready to List (RTL) Construction Contract Award Guide
7	Department	Plans Preparation Manual
8	Department	CADD Users Manual
9	Department	Encroachment Permit Manual
10	Department	Chapter 13 of the RW Manual
11	Department	Chapter 8 of the RW Manual, Section 8.69.00.00 RAILROADS

6.3 Design Requirements

6.3.1 General

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

6.3.2 Utilities Adjacent to Structures

Underground Utilities shall not be installed within 15 feet of any foundation element, unless otherwise approved by the Department.

Installation 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.

Utilities installed in the vicinity of MSE walls must follow restrictions outlined in the Department Technical Memorandum No. 03-16-MRR-06.

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 Civil Engineer who is certified by the National Association of Corrosion Engineers.

6.3.3 Verification

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

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

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

- Existing and proposed R/W;
- Existing topography;
- Proposed Project elements;
- Existing Utilities

6.3.4 Design by Design-Builder

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

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

6.3.5 Design by Utility Owner

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

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

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

6.4 Construction Requirements

6.4.1 Construction by Design-Builder

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

6.4.1.1 Inspection

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

6.4.1.2 Approval

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

6.4.2 Construction by Utility Owner

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

6.4.3 Incidental Utility Work

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

- Protection of existing Utilities
- Minor modification of existing facility

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

6.4.3.1 Protection of Existing Utilities

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

6.4.3.2 Utility Removal Work

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

6.4.4 Abandon in Place

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

6.4.7 Damage to Utilities by Design-Builder

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

Promptly after the Design-Builder's discovery of such damage or the Design-Builder's receipt of notice of any such damage from the Utility Owner or from any other source: (a) the Design-Builder shall repair the damage to the Utility Owner's satisfaction, or (b) at the Utility Owner's election, the Utility Owner may make such repairs at the Design-Builder's expense. If the Design-Builder fails to make any required payment to a Utility Owner 60 Days after receiving the Utility Owner's invoice, the Department may make such payment if required pursuant to the applicable MUA or otherwise at the Department's sole discretion. If the Design-Builder's failure to pay is due to a reasonable dispute, then the Department may not make such payment until at least 60 Days after the final resolution of such dispute has occurred without payment by the Design-Builder. If the Department makes any payment, the Design-Builder shall reimburse the Department for such payment within 10 Days after receipt of the Department's invoice, or, in the Department's discretion, the Department may deduct the amount of reimbursement due from the next payment (or payments, if necessary) due to Design-Builder under the Contract.

6.5 Deliverables

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

- Exhibit 6-A, MUA: The Design-Builder shall sign four originals and return all to the Department.
- Exhibit 6-B, Department Utility Permit Application: The Design-Builder shall submit one original with seven sketches to the Department for Approval on all Utilities that are designed by the Design-Builder. Submittal shall be within two Days of the Design-Builder's receipt of the Utility's Design Approval Letter. The Department will respond within 60 Working Days of receipt.
- Exhibit 6-C, Utility Tracking Report (blank form): One information copy of the Utility Tracking Report shall be submitted to the Department weekly or as otherwise directed by the Department. A preliminary Utility Tracking Report shall be submitted to the Department for Acceptance prior to NTP 2.
- Utility Design Sheet (UDS): The Design-Builder shall submit a copy to the Department and the Utility two Days before the initial Work Order meeting.
- Work Order: Design-Builder shall submit three originals of the Work Order (including any exhibits) to the Department for Approval upon execution by the Utility and Design-Builder. The Department will respond with comments within 10 Working Days of receipt.
- Design approval letters: The Design-Builder shall submit a copy of each design approval letter to the Department as an exhibit to each Work Order.
- The Design-Builder shall submit a construction inspection approval letter to the Department within seven Days of Utility Work completion for each Utility Work Order.
- The Design-Builder shall submit a construction inspection approval letter to the Department within seven Days of Utility Work completion for each segment of work accomplished by a Utility Owner.

EXHIBITS

Exhibit 6-A	Master Utility Agreement
Exhibit 6- B	Department Utility Permit
Exhibit 6-C	Utility Tracking Report
Exhibit 6-D	Utility Information

All exhibits are provided as electronic files

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 R/W Appraisal Maps (attached as Exhibit 7-A) indicate the existing and proposed right of way (R/W) lines and identifies those parcels required for the Project. The R/W Appraisal Map also delineates permanent and/or temporary easements being acquired by Department for Project

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 the R/W Status Chart (Exhibit7- B) 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 priority acquisitions to facilitate the timely completion of Project. The Department will make reasonable attempt to accommodate the Design Builder's priority acquisitions.

Right of possession of the R/W (and upon contract acceptance the improvements made thereon by 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 Design-Builder will be provided access to parcels identified on the R/W Appraisal Map as possession of a parcel, or group of parcels is obtained. The status of each parcel is indicated in the Right of Way Status Chart (Exhibit 7-B), and subsequent updates.

The Department will provide the Design-Builder monthly status updates regarding the status of the acquisition process for parcels 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	2006 Revised New Standard Plans
10	Department	Standard Plans May 2006
11	Department	Design-Build Modifications to the Standard Specifications for Construction
12	Department	Standard Specifications
13	Department	Technical Memoranda

Pursuant to 23 CFR §710.313(d)(1)(i), the Design-Builder shall comply with the procedures, guidelines, and standards set forth in the Department *Right of Way Manual* regardless of whether the procedures, guidelines, or standards are written as mandatory requirements. Wherever the *Right of Way Manual* refers to activities to be performed by the Department or Department personnel, the Design-Builder shall be responsible for conducting those activities. 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 *Certificate of Sufficiency / Hazardous Material Disclosure Document*

The Department will provide:

- R/W Appraisal Maps (Exhibit 7-A)
- Right of Way Status Chart (Exhibit 7-B)

- Right of Way Access Map – Carroll Canyon (Exhibit 7-C)

The Design-Builder shall verify that the designated R/W lines are sufficient to construct the project by completing the Certificate of Sufficiency (CoS) and a Hazardous Material Disclosure Document (HMDD) and returning to the Department. Additional CoS submittals will be required for any subsequent right of way changes as described below.

7.3.2 *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.

7.3.3 *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 16 calendar months from the date the right of way requirements are received from the Design-Builder to certify the parcel(s) for access. Schedule implications shall be incorporated into the Design-Builder's schedule and the Department shall not be responsible for any construction delays resulting from the acquisition and clearance of such Additional R/W. Access to the Additional R/W will not be allowed until the Department has notified the Design-Builder in writing that it is available for use.

7.3.4 *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 Workshall be included in the Design-Builder's Proposal Price.

7.5.1 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.

7.5.2 [NOT USED]

7.5.3 Eminent Domain – Condemnation

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.

EXHIBITS

Exhibit 7-A	R/W Appraisal Maps
Exhibit 7-B	Right of Way Status Chart
Exhibit 7-C	Right of Way Access Map – Carroll Canyon

All exhibits are provided as electronic files

8 GEOTECHNICAL

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.

Pre-contract limited geotechnical subsurface exploration has been performed for the Project to reduce unknowns and uncertainties. Geotechnical subsurface information obtained is included as part of the Preliminary Engineering Documents and provided in the Reference Information Documents (RID).

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 Proposals (RFP) due Date unless otherwise specified herein or modified by Addendum or Change Order.

Geotechnical Standards and Requirements

Priority	Agency	Title
1	Department	Seismic Design Criteria
2	AASHTO	LRFD Bridge Design Specifications with California Amendments to the AASHTO LRFD Bridge Design Specifications
3	Department	Bridge Design Specifications (LFD Version April 2000)
4	Department	Bridge Memo to Designers
5	Department	Standard Special Provisions
6	Department	Standard Specifications May 2006
7	Department	Standard Plans May 2006
8	Department	Soil and Rock Logging, Classification, and Presentation Manual
9	Department	Foundation Report Preparation for Bridges
10	Department	Guidelines for Structures Foundation Reports
11	Department	Guidelines for Preparing Geotechnical Design Reports
12	Department	Corrosion Guidelines

13	ASTM	American Society of Testing and Materials (ASTM) Standards
14	AASHTO	Standard Specifications for Transportation Materials and Methods of Sampling and Testing
15	Department	California Test Methods
16	Department	Independent Assurance Manual
17	Department	Foundation Manual
18	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	Drafting and Plans Manual of Instructions

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

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 schedule 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) calendar 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, the Design-Builder must 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, the Design-Builder must perform a minimum of one boring and/or CPT spaced every 250 ft. Perform a minimum of 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, the Design-Builder must 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.

The Design-Builder must perform minimum one soil boring for each overhead sign post support location.

For culverts greater than 30 inch span or diameter, the Design-Builder must 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 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

The Design-Builder must 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.

The Design-Builder must install geotechnical instruments where and when necessary. Replace or recalibrate instruments that are damaged during construction within 5 calendar days.

8.3.3.4 Borehole Site Cleanup

The Design-Builder must 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 transfer retrieved rock samples to Department Lab after required tests and analyses are completed. Department must keep these samples until at least completion of Project.

8.3.4 Geotechnical Reports

The Design-Builder must prepare and submit Geotechnical Design Reports (GDRs) and Foundation Reports (FRs). Prepare separate 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 foundation reports (PFRs) with LOTBs for type selection bridge submittal and/or special design retaining walls.

The Design-Builder must submit Geotechnical Design Reports, Foundation Reports, addenda, and revisions with contents in accordance with Section 8.5, for review. The Civil or Geotechnical Engineer and the Certified Engineering Geologist who performed the work on the reports, both must be licensed in the State of California.

The Design Builder will receive a response within 15 Working Days of receipt of each geotechnical report and no more than two geotechnical reports will be submitted for review per week. 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

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 Department 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 Department.

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 the 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

The Design-Builder shall develop and submit an Instrumentation and Monitoring Plan to verify damages to existing structures, slopes and other facilities due to the Design-Builder's construction activities. The Instrumentation and Monitoring Plan must include:

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

The Design-Builder shall replace or recalibrate any instruments damaged or no longer functioning within five calendar (5) days of such discovery of such damage. An Instrumentation and Monitoring Plan must be re-submitted 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

The Design-Builder must 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

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

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

9.2 Administrative Requirements

9.2.1 Laws, Standards, and Specifications

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

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

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

Priority	**Entity**	**Title**
1	State	All California Law
2	Department	Surveys Manual
3	Department	Standard Specifications May 2006
4	Department	Standard Plans 2006
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 the Department survey staff in association with the land surveying tasks required for this project. The Survey Manager shall be available to be on-site during design and construction activities. All land surveying required, as part of the project shall be in full compliance with all State and local laws. The Survey Manager shall have a thorough knowledge and understanding of all aspects of the standards and specifications identified in Section 9.2.1 above.

9.2.6 Department Supplied Information

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

- The location and coordinate values of the available horizontal and vertical control stations within the Project, Exhibit 9-A.
- Existing centerline roadway alignments.
- Engineering survey data.
- Photogrammetric mapping.

- Right of Way mapping.
- Land net retracement mapping.
- As-Built utility location information.

9.2.7 Safety Requirements

The Survey Manager and all staff performing land surveying tasks for this project shall have a thorough knowledge and understanding of all of the relevant safety practices and procedures as outlined in the 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 locate and preserve all previously established survey monuments located within the Project in accordance with Section 8771 of the Business and Professions Code.

9.3.3 Prepare Base Maps and Plan Sheets

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

9.3.3.1 Project Concept Review (30% Construction Review)

9.3.3.2 Surveys and Photogrammetric Mapping for Design

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

9.3.3.3 Photogrammetric Maps and Products

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

EXHIBIT 9-A

Survey Data

This exhibit is provided as an electronic file.

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 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:

Priority	*Author or Agency*	*Title*
1	Department	Standard Special Provisions
2	Department	Standard Specifications May 2006
3	Department	Highway Design Manual
4	Department	Storm Water Quality Handbook – Project Planning and Design Guide
5	Department	Technical Memoranda
6	Department	Geotechnical and Pavement Manual
7	Department	Asbestos and Regulated Waste Manual for Structure Demolition or Relocations for Construction Projects
8	Department	Construction Manual

10.2.2 References

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

Grading Publication References

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

10.3 Design Requirements

See Standards.

10.4 Construction Requirements

The Design-Builder shall remove all existing pavement, concrete barrier and footings, guardrail, curb and gutter, sidewalk, 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 with neat lines at the removal terminations.

10.4.1 [NOT USED]

10.4.2 Removal of Miscellaneous Objects

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

10.4.3 Disposal of Materials

Disposal of surplus excavated material on Department Right of Way 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 and duff shall not be removed from the Site. Topsoil and duff shall be stripped, stockpiled, and reused within the project limits.

10.5 Deliverables

10.5.1 [NOT USED]

10.5.2 Disposal Site Plan

If the Design-Builder proposes to dispose of surplus excavated material on Department Right of Way, the Design-Builder shall submit a Disposal Site Plan to Department for Approval and receive Department Approval before disposing any material. 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 Department no later than February 1st of each year or within 15 days after receiving the final report. Contact information for Department and statewide recycling coordinators is available via the following Internet address:

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

10.5.3 Borrow Site Plan

If borrow material is required for the Project, the Design-Builder shall submit a Borrow Site Plan to Department for Approval and must receive Department Approval before using the site. 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, HOV lane, acceleration lanes, deceleration lanes, auxiliary lanes, collector/distributer 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 initial publication date of this RFP unless otherwise specified herein or modified by Addendum or Change Order.

Roadway Standards

Priority	Agency	Title
1	State	California Manual of Uniform Traffic Control Devices
2	Department	Highway Design Manual (HDM)
3	AASHTO	Policy on Geometric Design of Highways and Streets
4	AASHTO	Policy on Design Standards - Interstate System
5	Department	Standard Special Provisions
6	Department	Design-Build Modifications to the Standard Specifications
7	Department	Standard Specifications May 2006
8	TRB	Highway Capacity Manual
9	AASHTO	Roadside Design Guide
10	Department	Project Development Procedures Manual
11	Various Agencies	Technical Memoranda
12	Department	Standard Plans 2006
13	Department	Traffic Manual

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
Department	Ready to List and Construction Contract Award Guide (RTL Guide)

11.2.3 Local Road System

The Design-Builder shall meet local road criteria provided by the local governing agencies in accordance with the *Caltrans Highway Design Manual* and *AASHTO Policy on Geometric Design of Highways and Streets* (Green Book) identified in Section 11.2.1.

11.2.4 Preliminary Engineering Plans

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

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

11.2.5 Software

The Design-Builder shall prepare drawings in MicroStation using CAiCE by AutoDesk on the same 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) days prior notice of such meetings. The Design Builder shall prepare and distribute a record of the minutes to the meeting within five (5) days.

11.3 Design Requirements

11.3.1 Design Standards

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

- Meet all Department roadway design and safety standards;
- Meet capacity for the specified design year;
- Meet all future improvements identified as the "preferred alternative" in the environmental document. Project defined as Stage 1 of the 805 North Managed Lanes project with additional project features included in the General Description of Project.

- Meet the widths of all cross streets as shown in the Preliminary Engineering Documents.

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

The Design Builder shall design and construct all roadway elements according to the Department standards. This includes but is not limited to horizontal alignment, vertical alignment, superelevation, cross slopes, lane widths, shoulder widths, medians, clear recovery zone, side slopes, and cut and fill slopes. This Project has additional specific requirements for some of these elements, which are given in this section.

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

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

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

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

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

The Design Builder shall use the methodologies given in the Highway Capacity Manual. All roadways and intersections shall be designed to accommodate the level of services presented in the Final Environmental Document or better for all movements for the design year. Analysis is to be based on the traffic volumes given in in the Final Environmental Document for the specified design year. Final lane configurations shall be based on the results of the LOS analysis.

The design vehicle type for all turning movements and acceleration/deceleration lengths for the mainline, ramps, arterials, and other roadways associated with the Project is the STAAand BUS-40, whichever vehicle governs a particular roadway element. For vertical curves and sight distance applications, the design vehicle is a passenger car or as required in the Caltrans Highway Design Manual.

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

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

PROJECT-SPECIFIC DESIGN STANDARDS

Roadway: I-805 Mainline Construction

Location: From SR-52 to just north of Mira Mesa Boulevard

Design Standards	Freeway Mainline
Jurisdictional System	Department
Functional Class	Freeway
Access Control	Full
Highway Type	Multi-Lane Divided, Urban Section
Design Vehicle	STAA
Terrain	Rolling
Traffic Volumes AADT Year 2006/2008	See Environmental Document
Traffic Volumes Projected AADT Year 2030	See Environmental Document
Projected Posted Speed	65 mph
Proposed Design Speed	70 mph
Shoulder Bus Use	No
Median Type	Concrete Median Barrier
Special Features:	
1. When applicable provide asphalt concrete dike on both sides for the entire mainline roadway when concrete barrier is not otherwise present. Provide dikes along the ramps and ramp acceleration and deceleration lanes consistent with the applicable Highway Design Manual and Standard Plans. Transitions between dikes where acceleration and deceleration lane tapers terminate shall be per the applicable Standard Plan sheets.	
2. The horizontal clearance to obstruction along shoulders shall be in accordance to the Highway Design Manual.	
3. Protection shall be provided on all retaining walls, sound walls, and barriers in accordance to the Highway Design Manual and Standard Plans.	

11.3.1.1 Slopes

All grading slopes shall be 1:4 (V:H) or flatter unless otherwise approved by the Department .

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*.

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

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

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

11.3.1.3 Fencing

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

11.3.1.4 Retaining Walls and Sound Walls

The Design Builder shall construct retaining walls in accordance with the Highway Design Manual. Sound walls shall be constructed according to the recommendations provided in the Environmental Document and as described in the Project.

The Design Builder shall construct, where practical and feasible, proposed sound walls prior to removal of existing sound walls.

11.3.1.5 Clearing and Grubbing

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

11.3.1.6 Early Start of Rough Grading

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

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

- Construction specifications (for fills)
- Environmental clearance
- Traffic Management Plan (TMP)

11.3.1.7 Visual Quality

The Design-Builder shall design and construct all work in compliance with the Environmental Document and the Visual Quality section in the technical provisions.

11.3.2 Design Exceptions

The Department has approved various design exceptions for the ultimate widening and improvements for the 805 North Managed Lanes project, which are included in Exhibit 11-A Fact Sheet Exceptions to Mandatory Design Standards and Exhibit 11-B Fact Sheet Exceptions to Advisory Design Standards. These design exceptions apply only at the locations specified in the design exception forms for areas where the ultimate widening cross sections are included in the Project. The Design-Builder shall meet or exceed all mitigation commitments listed in the forms. The Department discourages creating additional exceptions and increasing the magnitude of the existing approved exceptions, and will not consider exceptions for modest benefits.

In areas of the Project where the widening is not to the ultimate width, the Design-Builder will determine the need for further design exceptions and prepare Fact Sheet Exceptions to Mandatory and Advisory Design Standards. These may include but are not limited to lane widths, shoulder width, superelevation, and lateral clearance. The Department may consider these further exceptions from mandatory and advisory standards or criteria on a case-by-case basis, at specific locations where the Design-Builder demonstrates that substantial need to develop the scope of the Project, benefit to the Department and the public would accrue from the recommendation. Obtain the Department approval of any such changes to the standards or criteria. Fully and clearly document any changes from the Department standards and criteria and maintain a complete record of all such changes for the Department reference.

11.3.2.1 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 or to meet the scope of the Project may not meet these mandatory design requirements. For these variances, mandatory design exceptions may have already been approved by the Department and FHWA and are described below. The Design Builder shall determine the need for any further exceptions and coordinate early reviews to prepare for the submittal of 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, the Design Builder must demonstrate on a case-by-case basis that the exception is required to meet the scope of the Project or have 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 Design Builder is encouraged to coordinate early reviews prior to the submittal of design exception requests. Upon receipt of the design exception request, the request will be submitted to the Department Geometric Reviewer for their review and approval recommendation. The Department Geometric Reviewer will be available on a regular schedule each month. Once approved by the Department Design Coordinator, the Department will forward the exception request to FHWA for Approval on the 13 controlling criteria if

required (See Index 108.3 of the Highway Design Manual). This entire process could take approximately three (3) to six (6) months.

Exhibit 11-A Fact Sheet Exceptions to Mandatory Design Standards details the specific locations and minimum design parameters of the exceptions that have been approved. The Design Builder shall strive to enhance the geometric features of the Project and eliminate or minimize these design exceptions. The Design Builder should be cautioned that merely eliminating design exceptions without regard to the impacts to the overall design may not be considered an enhancement or benefit to the project. Each improvement to these design exceptions, when taken as a whole, shall provide an overall benefit to the traveling public over the existing or proposed conditions. The following four (4) Mandatory Design Exceptions have been approved for the ultimate widening and improvements for the 805 North Managed Lanes project:

- Design Exception #1 - Interchange Spacing
- Design Exception #2 - Shoulder Width
- Design Exception #3 - Superelevation rates
- Design Exception #4 – Traveled Way Cross Slope

11.3.2.2 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 or required to meet the scope of the Project may not meet these advisory design requirements. For these variances, advisory design exceptions may have already been approved by the Department and are described below. The Design Builder determines the need for any further exceptions and coordinates early reviews to prepare for the submittal of the final advisory 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, the Design Builder must demonstrate on a case-by-case basis that the exception is required to meet the scope of the Project or have 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 District approval. The Department Geometric Reviewer and FHWA approval are not necessary for an Advisory Design Exception.

The Design Builder is encouraged to coordinate early reviews prior to the submittal of design exception requests. Upon receipt of the design exception request, the Department will review and if deemed acceptable, approve the request.

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

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

The following eight (8) Advisory Design Exceptions have been approved for the ultimate widening and improvements for the 805 North Managed Lanes project :

- Advisory Design Exception #1 – Tangent between Reversing Curves,
- Advisory Design Exception #2 – Superelevation Transition
- Advisory Design Exception #3 – Superelevation Runoff
- Advisory Design Exception #4 – Freeway Exit
- Advisory Design Exception #5 – Design Speed on Freeway Connector
- Advisory Design Exception #6 – Maximum Profile Grade
- Advisory Design Exception #7 – Embankment Fill Side Slopes
- Advisory Design Exception #8 – Compound Curves

11.4 Construction Requirements

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

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. All documents must be submitted in both hardcopy and electronic form. 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 shall include but will not be limited to the following:

Title sheet

List of Standard Plans

Typical Cross Sections

Alignment plan (Project control)

Layouts

Profile and Superelevation

Earthwork Tabulation and Summary

Construction Detail Plan

Temporary Water Pollution Control

Erosion Control

Contour Grading Plan

Drainage Plans, Profile and Details

Utility Plans

Construction Area Signs Plan Stage Construction and Traffic Handling Plan

Detour Plans

Pavement Delineation and Sign Plans

Summary of Quantities

Retaining Wall Plans, Details and Quantities

Sound Wall Plans, Details and Quantities

Log of test borings

Bridge Design Plans

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 right 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.)

Title Sheet

Show: necessary station equations (only for the alignment that the length is based on); ; 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)

List 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.

Typical Cross 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

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; 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.

Layout

Show: locations of plan-view sheets (construction, paving, pavement sections, intersections, drainage); existing roadways; bodies of water; significant land features/topography; noise walls; alignments; curb types; pedestrian ramps; walls; bridges; existing features; R/W and easements; construction limits; curb radius centers and tangent points; gutter grades and spot elevations, if applicable

Label: proposed and existing roadways; bodies of water; cities; plan sheets; noise walls, construction features.

Profile and Superelevation Plans

Profile:

Provide: vertical control note indicating datum and benchmarks. May include Earthwork Tabulation and Summary on this sheet.

Label: grades; PVC/PVI/PVT information; design speed met; high and low points; beginning and end points; lengths of vertical curve; 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

Superelevation:

Show: superelevation transition patterns and, if needed, superelevation profile diagrams

Label: alignments; walls; bridges

Dimension: roadway and shoulder widths; slopes; transition end points

Earthwork Tabulation and Summary

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

Construction Detail 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

Cross-Sections

Show: existing and proposed Utilities; existing and proposed R/W and easements

Provide: 1-inch grid

11.5.2.2 Design Calculations

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

- Horizontal sight distance (Intersections, all Roads, and mainline)
- Vertical sight distance: stopping, decision sight distance, and passing (if applicable) for all Roads
- Intersection geometrics (vehicle turning movements)
- Clear recovery 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

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

EXHIBITS

Exhibit 11-A	Fact Sheet Exceptions to Mandatory Design Standards
Exhibit 11-B	Fact Sheet Exceptions to Advisory Design Standards

All 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, permanent and temporary stormwater management systems, structural pollution control devices, retention/detention facilities (ponds), and closed storm drain systems.

12.2 Administrative Requirements

12.2.1 Standards

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

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

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

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

Drainage Standards

Priority	Agency	Title
1	Department	Highway Design Manual
2	Department	Bridge Design Specifications (LFD Version, April 2000)
3	Department	Bridge Design Aids
4	Department	Bridge Design Details
5	Department	Bridge Design Practice
6	Department	Standard Special Provisions
7	Department	Standard Specifications May 2006
8	Department	Standard Plans 2006
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	Department	Project Planning and Design Guide
12	Department	Construction Manual
13	Department	Design Information Bulletin 83

12.2.2 References

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

Drainage Publications References

Agency	Title
AASHTO	Roadside Design Guide
AASHTO	Model Drainage Manual
Department	Ready –To-List and Construction Contract Award Guide (RTL Guide)
Department	Plans Preparation Manual
Department	District 11 Hydraulics Section Guidelines for Hydraulics Design on Caltrans Projects (D11 HSG)
Department	District 11 Hydraulics Department Do's and Don'ts
FHWA	Hydraulic Design and Procedures Manual
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 Preliminary Engineering Plans

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

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

12.2.4 Software

The Design-Builder shall use Haestad StormCad (version 5.5 or newer) or choose drainage design software from various drainage software packages listed in the *Caltrans Highway Design Manual* for analyzing and designing all systems.

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

12.2.5 Data Collection

To establish a drainage system that complies with the requirements and accommodates the historical hydrologic flows in the Project limits, the Design-Builder is responsible for collecting all necessary data, including, but not necessarily limited to the elements outlined below:

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

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

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

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

12.2.4 Coordination with Other Agencies and Disciplines

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

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

12.3 Design Requirements

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

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

12.3.1 Project Specific Requirements

Median drainage systems shall be designed to accommodate flow for the Interstate 805 Managed Lanes North Project ultimate condition.

The Design-Builder shall incorporate a drainage design with a primary use of G1 and G2 inlets. The use of Grated Line Drains and/or Slotted Pipe inlets will need prior approval by the Department.

Existing Slotted Corrugated Metal Pipe within the median areas shall be removed and/ or replaced with an appropriate substitute as approved by the Department.

Storm drain pipe materials shall be approved by the Department.

12.3.2 Surface Hydrology

12.3.2.1 Design Frequencies

The drainage design frequencies shall be as indicated by the *Caltrans Highway Design Manual.*

The Design-Builder shall use rainfall intensity obtained from *IDF2000* as approved by Department District 11 Hydraulics Department. The Design-Builder shall evaluate flood potential for extreme storms, including areas inundated and flow routes for water leaving the Department facilities

12.3.2.2 Hydrologic Methods

The Design-Builder shall perform onsite hydrologic analyses using the Rational Method and offsite hydrologic analyses (where necessary) as prescribed by the *Caltrans Highway Design Manual.*

The Design-Builder shall use the storm flow information in the I-805 Managed Lanes North Offsite Drainage Report (August 2007). No other information in the I-805 Managed Lanes North Offsite Drainage Report can be considered accurate by the Design-Builder for purposes of design or construction of this Project.

12.3.3 Permanent Stormwater Treatment BMPs

The Design-Builder shall design and construct stormwater treatment systems to meet requirements for water quality, water quantity, and rate control, as determined by local, State and federal requirements and the Department NPDES regulations. This includes but is not limited to the Department Permit (Order No. 99-06-DWQ) (NPDES Permit) and the Construction General Permit (Order No. 2009-0009-DWQ) (CGP). Design Builder will comply with the provisions of the Department Permit (Order No. 99-06-DWQ) which is in effect on the Proposal due date.

12.3.4 Hydraulic Structures

For all crossings (bridges and culverts) requiring structures greater than 48 inches in diameter, the Design-Builder shall complete a bridge or culvert Hydraulics Recommendation Letter and supporting hydraulic computations. These documents shall be submitted to the Department for approval.

12.3.5 Culverts

A culvert is a hydraulic structure sized to convey water runoff under a highway, railroad, or other embankment.

The Design-Builder shall survey and analyze the existing and proposed culverts and drainageways 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 local watershed management organization and the affected cities' stormwater management criteria or master drainage plans.

12.3.6 Bridges

A structure is classified as a bridge when its span is more than 20 feet, measured along the centerline of the road between undercopings of abutments, and multiple span structures, including culverts, where the total measurement of the individual spans are in excess of 20 feet, measured from center to center of supports along the centerline of the road and the distance between individual culvert barrels is less than one-half the culvert diameter. Bridge structures over waterways shall be designed to convey discharges as open channel flow.

All hydraulic computations, designs, and recommendations shall consider past studies and projects in the area by the COE, and other State or Federal agency studies and projects.

12.3.6.1 Method Used to Estimate Flow

The Design Builder is responsible for determining the appropriate discharge, but not necessarily limited to the elements outlined below:

Estimated discharge shall be based on Site conditions, method limitations, and engineering judgement for determining the design flow for the structure. The Design Builder shall ensure that the conditions in the watershed conform to the limitations of the selected hydrologic method. For all methods, available historical data shall be reviewed and the design flow justified as meeting the local Project conditions. Master Drainage Plans should be incorporated when appropriate.

For all crossings located within a FEMA Flood Insurance Study (FIS) with peak flow information, the flow information provided in the FIS and any subsequent Letters of Map Revision (LOMR) shall be used.

For a crossing on the same waterway as a stream gauging station with a length of record of at least 25 years, the flow data available from the station shall be used to determine design flows provided there is no major control structure between the gauge and the design site. The USGS software package, PEAKFQ, shall be used for the gauge frequency analysis.

For crossings not located within a FEMA FIS or on a gauged waterway, the Design Builder shall select the appropriate method for calculating the design flows from the *Caltrans Bridge Design Practices* and *Bridge Design Aids* based on Site conditions, method limitations, and engineering judgment.

For design Sites where the local conditions require a hydrograph analysis, the Design Builder shall use the NRCS (SCS) Runoff hydrograph procedures.

Design discharge should be confirmed and agreed upon with the local water and/or flood agency.

12.3.6.2 Design Frequency

Bridges shall be designed to convey a minimum of 50-year frequency plus adequate freeboard. A drift evaluation should be made to determine adequate freeboard. Local agencies may have their own freeboard requirements for a particular site. Design should also be able to convey the 100-year and flood of record events. Designs shall also meet the local Water District/Flood Agency design criteria. Other flows that shall be analyzed are the overtopping flood and the 500-year event.

Bridges with piers shall be evaluated for scour potential including drift as appropriate.

For interstate highways, the minimum overtopping flood shall be the 50-year frequency. The two-year flood shall be analyzed if there are fish passage concerns as part of the Fish & Game permit process.

12.3.6.3 Hydraulic Analysis

The United States Army Corps of Engineers (COE) HEC-RAS Water Surface Profile Program (current released version) shall be used for performing the hydraulic analyses at bridge crossings (including culvert structures that meet bridge definitions).

The Federal Highway Administration (FHWA) culvert analysis program, HY-8, or Haestad Methods, CulvertMaster, or COE HEC-RAS Water Surface Profile Program shall be used for performing the hydraulic analyses at culvert crossings.

Whenever HEC-RAS models are developed, HEC-RAS models for Pre, Interim, and Post project conditions must be provided.

Bridge scour shall be analyzed using HEC-18, *Evaluating Scour at Bridges*. HEC-18 provides general guidance to assist in the assessment. New California bridges are designed with the top of footing at or below the total calculated scour due to the 100-year discharge. Footings designed to these criteria would not need a 500-year stability check. Substructures without footings may need to be evaluated for the 500-year event.

All piers in the 500-year floodplain shall be evaluated for scour and shall be designed to be stable for the predicted scour. Pier stability shall not be dependent on countermeasures.

Riprap at abutments shall be designed in accordance with the procedures outlined in HEC-23. For bridge abutments in urban areas or those frequently used by pedestrians, alternatives to random riprap may be recommended.

12.3.6.4 Bridge/Culvert Waterway Design

For an existing crossing, the new culvert or bridge shall be designed so that it does not cause a significantly greater headwater than the current condition. For major culvers, the maximum allowable headwater elevation for the design frequency shall not exceed the shoulder PI elevation of the roadway low point. For minor culverts, the maximum allowable headwater elevation for the design frequency shall not exceed 1 foot below the shoulder PI elevation of the roadway low point. Culvert extensions may increase the headwater elevation, but not above the maximum allowable headwater.

Bridge waterway design shall maintain the existing channel morphology through the structure, if possible.

If a bridge is over commercial or recreational navigable waterway, the Design Builder shall follow appropriate recommendations and provide sufficient clearance.

Hydrologic and hydraulic information and waterway design recommendations shall be submitted to the Department on Hydrologic Summary Table as shown in the Memos to Designers, with the appropriate information also shown on the bridge and/or grading plan. Definitions for terms used can be found in the following information:

Bridges

- Stage – Unconstructed water surface elevation sufficiently upstream of the bridge as to not have effects of drawdown (i.e., natural conditions)
- Headwater – Constricted water surface elevation sufficiently upstream of the bridge (i.e., bridge existing and bridge proposed)
- Stage Increase – Difference in elevation between headwater and stage, taken at the same location

12.3.6.5 Bridge Deck Drainage

Runoff from bridge decks shall be carried off the bridge and into the adjacent roadway drainage system. The roadway drainage design shall include bridge approach drains to intercept gutter flow at both ends of the bridge. These drains, or temporary drains, are to be constructed at time of bridge deck placement to prevent erosion. Stormwater flowing toward the bridge shall be intercepted prior to the approach slab. Bridge deck drainage shall be routed through a pond or other approved stormwater management system before discharge to the natural waters of the State. The Design Builder shall comply with bridge deck drainage design as outlined in HEC-21, *Design of Bridge Deck Drainage*. Drainage design frequencies for bridge deck drainage shall have the same criteria as those for roadways.

12.3.6.6 Bridge and Major Culvert Drainage Report

A report shall be prepared for the major stream crossings and shall include the detailed calculations and electronic and printed copies of the computer software input and output files, as well as a discussion about

the hydrologic and hydraulic analysis and reasons for the design recommendations. The report shall include for each crossing:

Hydrology

- Drainage area maps with watershed characteristics, hardcopy, and ArcView shapefile (UTM coordinates)
- Hydrologic calculations (where computer software is used, both hardcopy and electronic input and output files)
- Historical or Site date used to review computed flows

Hydraulics and Recommended Waterway Opening and/or Structure

- Photographs of Site
- General plan, profile, and elevation of recommended waterway opening and/or structure
- Calculations – hard copy of output, as well as electronic input and output files for all computer models used for final analysis or for permit request, as well as summary of what the models are
- Cross-sections of waterway (The Design Builder shall provide a hard copy plot, plus any electronic data used. If CAiCE is used to develop cross-sections, the Design Builder shall include elevation model, as well as location of cross sections.)
- Profiles of channel

Scour Analysis (for Bridges)

- Channel cross-section at bridge showing predicted scour
- Calculations and summary of calculations, clearly showing predicted scour and assumptions regarding bridge opening and piers used to calculate predicted scour
- Discussion of review of long-term degradation/aggradation and contraction scour
- Individual scour component depths (including zero values) and the long-term scour and total scour elevations shall be provided
- Recommendation for abutment protection
- This report shall be included in the Final Hydraulic Report.

12.3.7 Storm Drains and Sewer

12.3.7.1 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.

12.3.8 Roadside Open Channels

Roadside open channels shall not be

used on this Project unless otherwise approved by the Department. If used, 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.

12.4 Construction Requirements

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

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

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

Existing sanitary drain 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 drain installation.

The Design Builder shall maintain spreadwidth requirements based on a Department approved design storm for temporary stage construction.

The Design-Builder shall coordinate all construction activities with businesses impacted by the construction.

All surfaces impacted by construction shall be restored.

Storm sewer within the roadway area being milled and overlayed 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.

12.5 Deliverables

12.5.1 Project Drainage Overview Map

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

12.5.2 Released for Construction Documents (RFC)

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

- Drainage plans including the SWPPP

- Drainage profiles
- Drainage tabulations and estimated quantities
- Drainage calculations and drainage models as prescribed in the General Guidelines for Drainage Reports section of the D11 HSG.
- Specifications and Special Provisions

12.5.2.1 Drainage Plans

- Drainage plans shall follow the Caltrans Plans Preparation Manual

12.5.2.2 Drainage Profiles

- Drainage profiles shall follow the Caltrans Plans Preparation Manual

12.5.2.3 Drainage Tabulations

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

12.5.2.4 Specifications and Special Provisions

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

12.5.3 Reports/Project Documentation

The Design-Builder shall provide the Department with a Drainage Design Report signed by a California-licensed Civil 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
- Drainage plans, profiles, details, and quantities

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.

12.5.4 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.

13 STRUCTURES

13.1 General

All structures and modification to structures shall comply with the specifications and requirements contained in the technical manuals listed in the Structure Design and Plans Section of this provision and any additional requirements noted in these Technical Provisions.

Bridge Specific Technical Provisions recommended for each structure shall over-ride the General Technical Provisions.

13.2 Administrative Requirements

13.2.1 Structure Design and Plans

Structure Plans shall be prepared in accordance with, but by no means limited to, the latest editions of manuals and documents listed below:

Use the most current version of each listed standard as of the Request For Proposals (RFP) issue date unless specified here or modified by Addendum or Change Order.

13.2.1.1 All Structures and Structural Appurtenances and Retaining Wall Structures Standards and Requirements

Priority	Agency	Title
1	Department	Seismic Design Criteria
2	AASHTO	LRFD Bridge Design Specifications, 4th Edition with California Amendments to AASHTO LRFD Bridge Design Specifications 4th Edition
3	Department	Bridge Design Specifications (LFD Version, April 2000)
4	Department	Bridge Memo to Designers
5	Department	Bridge Design Aids
6	Department	Bridge Design Details
7	Department	Design Practice, as appropriate
8	Department	Bridge Standard Detail Sheets (XS Sheets)
9	Department	Structural Detailing Standards
10	Department	Standards Special Provisions
11	Department	Design-Build Modifications to the Standard Specifications for Construction
12	Department	Standard Specifications May 2006
13	Department	Standard Plans May 2006
14	NCTD	North County Transit District Guidelines for Projects on or Adjacent to Railroad Right-of- Way
15	BNSF/UP	Guidelines for Railroad Grade Separation Projects
16	AREMA	American Railway Engineering and Maintenance-of-Way Association for

		Railway Engineering
17	Department	Bridge Deck Construction Manual
18	Department	Falsework Manual
19	Department	Foundation Manual
20	Department	Prestress Manual
21	Department	Construction Manual
22	Department	Bridge Construction Record and Procedures Manual
23	Department	Trenching and Shoring Manual
24	Department	Outline of Field Construction Practices
25	Department	Plans Preparation Manual
26	AASHTO	Manual for Bridge Evaluation, 2nd Edition with 2011 Interim Revisions
27	Department	Highway Design Manual (HDM)
28	Department	Landscape and Structures Aesthetics Handbook
29	Department	Design Memoranda
30	Department	Final EIR/EIS for Project
		Sign and Lighting Structures
	AASHTO	Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals

Any non-standard designs, details, manuals, or documents other than those approved by the Department will require approval prior to being used for design or the preparation of structure plans. The Design-Builder is required to submit any non-standards designs, details, or documents to the Department for review and approval as soon as the need is identified.

Current Bridge Standard Details Sheets (XS-Sheets) and Standard Plan 2006 including Revisions to Standard Plans (RSPs) shall be incorporated into the structure plans as applicable.

13.2.2 Structure Plan Submittals

Plan sheets for all structures shall be in accordance with the Department practices using Caltrans Standards, specifications, and details. Specific provisions for bridge detailing shall follow Caltrans Bridge Detailing Manual.

The following structure submittals shall be provided to the Department for review on each structure:

- Concept Design – Structure Type Selection (30%) Submittal
- Intermediate Design - Unchecked Structure Details (65%) Submittal
- Final Design - Checked Structure Details (100%) Submittal
- Released-for-Construction (RFC) Submittal
- Final As-Built Plans Submittal

All structure submittals across railroads (Overhead Structures) must comply with the Metropolitan Transit (MTS) and *North County Transit District (NCTD) Guidelines for Projects on or Adjacent to Railroad* submittal criteria. Prior to submission to the railroad companies, the Design-Builder must have 100%

completed plans per Section 13.2.2.3 "Final Design - Checked Structure Details (100%) Submittal" .The Design-Builder shall adhere to any railroad agreements as required in Section 6 "Utilities" or in Section 24 "Railroad".

13.2.2.1 Concept Design – Structure Type Selection (30 %) Submittal

The Design-Builder shall submit a General Plan and Type Selection Report for each structure requiring a type selection process to the Department for review and approval. General Plan and Type Selection Report shall follow the format described in *Bridge Memo to Designers 1-29 and in accordance with preliminary data checklist provided in Caltrans Bridge Design Aids*. The report shall include but is not limited to the following:

- Evaluation and location of deck drains for widened structures.
- Hydraulics/Hydrology Reports
- A quantitative seismic design evaluation of all new structures and retrofit evaluation of all existing structures to be widened or modified. For existing structures to be widened, the Type Selection Report shall include a summary of the seismic design evaluation and strategies of the new structures, seismic evaluation and potential retrofit strategies of the existing bridges, appropriate supporting documentation, and other pertinent details.
- Preliminary foundation reports (PFRs)

Type Selection Reports shall clearly delineate aesthetic features that the Design-Builder has incorporated into the structure type. For existing structures to be widened that requires seismic retrofitting, the Department must approve the retrofit strategy prior to substantial completion of structure design. The Department will have fifteen (15) Working Days to review the proposed retrofit strategies.

All Type Selection Meetings will be scheduled after the Department has approved the project geometrics and a minimum of five (5) working days following receipt of a complete Type Selection Report and all related documents. The meeting may be held at the Department District 11 facilities. At the meeting, the Design-Builder shall present the proposed structure and shall briefly discuss issues pertinent to the selection of the structure type, particularly requirements for foundations, hydraulics, construction (including falsework), seismic design, retrofit strategy, aesthetics, traffic handling, and other information needed to support the structure type.

After the meeting, the Design-Builder shall prepare a meeting summary and provide a copy to the Department within three (3)working days. The meeting summary may be used to update or supplement the information in the Type Selection Report to address comments raised at the meeting. Provided all issues raised at the Type Selection Meeting are satisfactorily addressed, the Department will provide written approval or denial of the proposed structure type within five (5) working days of receiving the final meeting summary.

Within 10 working days after receiving written approval of the structure type, Design-Builder shall update the General Plan and submit the required number of reduced copies to the Department for comment. Design-Builder shall incorporate any comments from the Department into the Final Design Documents.

13.2.2.2 Intermediate Design- Unchecked Structure Details (65%) Submittal

The Design-Builder shall submit the Intermediate Design – Unchecked Structure Details and Plans to the Department. The Department performs review on Unchecked Structure Details to discern and raise significant potential issues and to provide the Design-Builder with constructive feedback for use in preparing subsequent submittals. The structure design information shall be suitable for content and format review and coordination with other design disciplines to integrate all bridge appurtenances into the plan set. It is not necessary to have structural design checks complete at this stage.

The Intermediate (65%) Bridge Plan packages shall include complete dimensional detailing for all bridge structural elements and include all detail design sheets. This shall include title sheets; bridge layouts; staging and removal plans; foundation report, foundation layouts; foundation details and design tables; boring logs; abutment details; bent details; framing plans and elevations; slab plans, typical sections and details; beam details and data sheets; deflection and camber diagrams; architectural elevations and other details as applicable. Packages shall list Caltrans bridge standards to be used. Proposed modification to the Department standards shall also be provided.

Individual detail sheet contents shall be in accordance with applicable checklists provided in Caltrans Bridge Detailing Manual.

13.2.2.3 Final Design Checked Structure Details (100 %) Submittal

Final Design Checked Structure Details (100 %) Submittal shall include completed bridge layouts and final structural details for superstructure, substructure, and all bridge appurtenances. Package shall include Final Foundation Report, LOTB's, structure quantities, and structure special provisions.

The Final Design Checked Structure Details (100%) Bridge Submittal will not be considered complete unless the calculations and plans are available, complete, and independently checked.

13.2.2.4 Released-for-Construction (RFC) Bridge Submittal

The Design-Builder shall include all bridge and structural details in the Final RFC submittal. For RFC submittal procedures refer to Section 2.4.2.3.4 "Design Submittals – Released for Construction Submittals." For structure elements or segments of a bridge structure, such as structure foundations, to be Released-For-Construction prior to final completed design, the RFC segment submittal shall meet the final checked (100%) bridge submittal requirements for each particular structural element to be constructed.

13.2.2.5 Final As-Built Structure Plans Submittal

The Design-Builder shall submit structure As-Built plans per Section 2.4.3.4 "As-Built Documents."

13.2.3 Bridge Names and Numbers

Requests for bridge numbers and names for new and replacement structures shall include:

- County and State Route Identification Number;
- Post Mile at Beginning of Bridge (to the nearest .01 PM); and
- Site Map or Strip Map of sufficient detail to clearly indicate the relationship of the street names and names of the pertinent features in the vicinity of the bridge site.

The assigned bridge name and number shall be painted on all structures, and the bridge name and number of the existing structures shall be painted on the widened structures. Locations indicating where to paint the bridge number and name on a structure shall be shown on the General Plan in accordance with Caltrans' Bridge Design Details.

A request for numbers and names must also be made for earth retaining structures designed not using *Caltrans Standard Plans*.

13.2.4 Bridge Load Rating

The Design-Builder shall load rate the bridges by the Load and Resistance Factor Rating method in accordance with the AASHTO Manual for Bridge Evaluation and AASHTO LRFD Bridge Design Specifications with California Amendments. The ratings shall be based on the final As-Built configuration of the bridges. Complete and detailed As-Built structural models shall be provided to the Department for all

bridge structures. The load rating models shall be developed by a California licensed Civil Engineer and checked by a licensed Civil Engineer using the latest version of CSI BRIDGE or Midas Civil computer bridge analysis program and shall consider effects of construction staging. Girder bridges shall be developed using 3 dimensional models. Load rating results from the models shall be generated for superstructure elements of the bridges that carry live loads and for bent caps based on HL-93 and Permit Design Loads.

Each separate bridge component, segment, or element that is constructed or modified under this Project shall be rated and reported to the Department in a Bridge Load Rating Report. At a minimum, ratings shall be computed for moment and shear at the one-tenth points of each bridge span.

The overall rating shall be the lowest rating of any individual component, segment, or type. The final rating and each component rating shall be accompanied by the location of the rating, the limit state, and the impact factor.

A Bridge Load Rating report shall be provided that defines all of the assumptions used in the analysis and summarizes load rating results for all structural elements of the bridge. The Bridge Load Rating Report shall also include the load rating analysis computer model electronic files as an attachment.

13.3 Structure Design Requirements

13.3.1 General Bridge Design Requirement

The Design-Builder shall provide all new structural components necessary for a complete and functional structural system that provides functionality, durability, ease of maintenance, safety and aesthetics.

13.3.2 Design Specifications

The design shall be in accordance with AASHTO LRFD Bridge Design Specification, and applicable Interim Revisions and California Amendments to AASHTO LRFD Bridge Design Specification. Seismic design shall be in accordance with Caltrans Seismic Design Criteria and Caltrans Bridge Memo to Designers.

The proposed bridges shall be designed and constructed to accommodate future overlay loads (35psf).

The Design-Builder shall ensure that existing structures to be widened shall be seismically evaluated and retrofitted in accordance to all applicable Department maintenance requirements.

13.3.3 Vertical Clearances

The minimum vertical clearances for the project shall meet the following without exceptions:

- Permanent minimum Vertical Clearances: 16’-6” over freeway mainlines, connectors and ramps and 15’-0” over local streets.
- Temporary minimum Vertical Clearances for falsework openings: 15’-0” over freeway mainlines and local streets.
- For Permanent minimum Vertical and Horizontal Clearances and Temporary minimum Vertical and Horizontal clearance requirements for bridges over the Railroad, refer to Northern County Transit District guidelines.
- Further study and field surveys are recommended to confirm the actual vertical clearances.

13.3.4 Geotechnical Reports

The Design-Builder shall perform geotechnical investigations at the bridge site and produce Geotechnical Design Reports (GDRs) and Foundation Reports (FRs). Foundation type, capacity, estimated lengths, and bottom elevations shall be determined by the Design-Builder in accordance with the Geotechnical Report for

the structure. Analysis shall include bearing capacities, factors of safety and an estimate of total and anticipated differential settlement for each structure. The Preliminary Foundation Reports, Geotechnical Design Reports and Foundation Reports shall conform to Technical Provisions Section 8, "Geotechnical".

For preliminary geotechnical and seismicity information, see the Structures Preliminary Geotechnical Report (SPGR) included in the Reference Information Documents.

13.3.5 Hydraulics Reports

A hydrologic investigation/scour analysis and structure hydraulic report is required for bridges over waterways, bridges that are adjacent to streams or waterways which may affect the structure design or construction. Waterway bridge crossings should convey all flows as open channel with no significant change in water surface elevation.

13.3.6 Deck Drains

Bridge deck drains shall be provided when drainage design requires drain inlets located on the bridge superstructure and shall conform to Section 12.3.5.2.5, "Bridge Deck Drainage". Bridge deck drains shall be part of a closed drainage system and drain into a water quality system or a storm drainage system. Closed drainage systems shall include piping cast into the bridge columns or otherwise hidden from view; exposed piping on the outside of columns or exterior girders shall not be permitted. The Design-Builder shall not use an open rail system. The Design-Builder's attention is directed to "Section 12 – Drainage" of the Technical Provisions.

13.3.7 Structure Types Restricted from Use

The following structure alternative types are not allowed on the project as permanent structures:

- Structural Steel super structures (e.g. girders and bent caps)
- C-bents
- Soil-nail wall and Mechanically-Stabilized Earth (MSE) systems serving as bridge abutments
- Precast concrete substructure
- Asphalt concrete overlay on bridge decks
- Recycled materials used for structure backfills on earth retaining systems and foundations
- Earth retaining systems and other structural elements that are not pre-approved by the Department or not currently allowed in the Department's Standards.

13.3.8 Approach Slabs

The Design-Builder is required to design and construct new approach slabs at the proposed bridge ends.

13.3.9 Joints

The Design-Builder shall minimize the number of deck joints. The design and location of the joints shall provide for maintenance accessibility and future replacement. All joints shall be Caltrans standard sealed expansion joints. Exceptions from standard sealed expansion joints will be considered by the Department, if the Design-Builder can demonstrate standard sealed expansion joints are not suitable for particular applications. Longitudinal joints are not allowed unless approved by the Department.

13.3.10 Slopes

Abutment end slopes beneath bridges shall be no steeper than 1.5:1 or match existing slopes, unless approved by the Department.

13.3.11 Bridge Railings and Barriers

The Design-Builder shall use either the Caltrans Standard bridge railings (or barriers) or a modified railing (or barrier) type as specified in *Caltrans Standard Specifications* and the *Caltrans Standard Plans*. Bridge railing and barrier systems shall conform to standards established by the Department.

13.3.12 Bridge Aesthetics

Aesthetic treatments shall be limited to those surfaces as outlined in the " Section 15 - Visual Quality Management" included in EXHIBIT A. The Design-Builder shall promote a consistent aesthetic "theme" for the entire Project corridor. While certain preliminary aesthetic and architectural renderings are included in the Preliminary Design and Technical Requirements, the Design-Builder shall be responsible for complying with all standards included in the Contract Documents to provide the required project elements. The Design-Builder's attention is directed to "Section 15 – Visual Quality Management" of the Technical Provisions.

13.3.13 Soundwalls

A supplemental plan set shall provide the location limits and heights of standard soundwalls. The Design-Builder shall not be required to do additional noise studies to those already provided, unless the Design-Builder changes the basic configuration in such a way so as to make the current noise studies no longer applicable. Any changes in the locations or heights of standard soundwalls in the supplemental plan set may require additional analysis, calculations, modeling, and reporting based on the Department's standards, including visual impacts and community input.

13.3.14 Overhead Sign Structures

Structural design of sign supports shall be in accordance with Caltrans Standard Plans and Specifications for Overhead Sign Structures. Overhead Sign Structures shall be submitted in accordance with Section 2.4.2.3.4, "Quality Manual–Design: Shop and Working Drawing Documents". Overhead Sign Structure foundation design shall be based on recommendations in the Overhead Sign Structure Foundation Report. The Foundation Report shall conform to Section 8, "Geotechnical".

13.3.15 Utilities and Existing Facilities

The Design-Builder's attention is directed to the existence of several underground and overhead utilities on or adjacent to the existing structures. The Design-Builder is required to locate all existing underground and overhead utilities on or adjacent to the proposed structures and existing structures to be modified and shall be shown on the foundation plans. Placing conduits along exterior bridge railings will not be allowed. The Design-builder's attention is directed to Section 6.3.2, "Utilities Adjacent to Structures."

13.3.16 Railroad

The proposed project crosses the Railroad over two existing locations at the Rose Canyon Overhead Bridges and at Soledad Canyon Overhead Bridges and over new location at Carroll Canyon DAR. The Design-Builder shall be responsible for coordination with Metropolitan Transit System (MTS) and North County Transit District (NCTD) for all design and construction requirements on railroad right of way (R/W).

The Design-Builder is responsible for obtaining and complying with all applicable design and construction specifications and requirements. The Design-Builder is responsible for performing the work in accordance with the terms specified in the Construction and Maintenance (C&M) Agreement prior to the commencement

of any construction. Temporary minimum horizontal and temporary minimum vertical construction clearances shall be shown on the project plans for projects impacting the Railroad.

13.3.17 Miscellaneous Structures

Miscellaneous structures include, but are not limited to, the following structure types:

- Earth retaining systems (retaining walls), including aesthetic treatments
- Soundwalls, including aesthetic treatments
- Bridge-mounted signs
- Barrier-mounted signs on structures
- Overhead sign structures
- Culverts and drainage structures

Miscellaneous structures shall be designed in accordance with the latest editions of the *Caltrans Highway Design Manual*, *Caltrans Bridge Design Specifications*, *Caltrans Bridge Memo to Designers*, *Caltrans Bridge Design Aids*, Visual Quality Manual, and other applicable requirements included in these Technical Provisions and the Department standards.

Deliverables are generally the same for miscellaneous structures as for bridge structures and shall meet the requirements in these Technical Provisions. Any variations from these requirements (e.g., submittal requirements, review duration, etc.) will be allowed only by express written permission.

13.3.18 Reference Materials

Structure reference materials included in the Reference Information Documents are for the Design-Builder's information only. The structure reference materials include As-Built plans of adjacent existing bridges, contract plans for adjacent existing bridges under construction, Advanced Planning Study (APS) reports, retaining wall/drainage structure sections, survey information, existing bridge photographs, etc.

13.3.18.1 Advance Planning Studies

Advance Planning Study (APS) reports are included in the Reference Information Documents. The APS reports contain information that the Design-Builder may find valuable in preparing the Final Design Documents. However, revisions to the structure type, if not specifically limited elsewhere in the project documentation, and/or the alignment indicated in the APS may be necessary and shall be subject to analysis at the Type Selection stage of the Project to ensure that all Contract requirements are met.

The following information is provided to assist the Design-Builder in determining the level of completion and suitability of any portion of the APS documents:

- In most cases, the APS reports include a single structure alternative. Other structure alternative types may be considered, unless specifically prohibited in this document, but must be approved by the Alternative Technical Concept review phase specified in the Instruction to the Proposers (ITP).
- Structure aesthetics features are not included in the APS reports. However the Type Selection Reports shall clearly delineate Aesthetic features and shall be consistent with the Visual Quality Manual.
- Deck drains may be necessary for structures that are being widened.

13.4 Retaining Wall Design Requirements

13. 4.1 Permanent Retaining Wall Structures

The Design-Builder shall determine the location(s) and types of retaining walls needed on the Project. The Design-Builder shall minimize the need and visual impacts of all walls on the Project by utilizing wall profiles and alignments, which blend with the natural terrain. Where side slopes would exceed the right of way, retaining walls shall be used. Wall type selection and design by the Design-Builder shall meet all applicable Department requirements including, but not limited to, those related to differential settlement, Visual Quality Management, Utilities, Lighting, Signage, Drainage, and Landscaping. The Design-Builder shall notify the Department of any potential right of way conflicts at the preliminary design stage.

Where possible, adjacent retaining walls shall be interconnected or curved into the existing or finished grade to eliminate blunt ends and avoid the use of guardrails, attenuators, or other safety devises at the ends. Long vertical curves shall be used at the top of the wall's profile and avoid abrupt tangents and chords.

The Design-Builder shall not use any non pre-approved Proprietary wall systems. When pre-approved proprietary or alternate wall systems other than the Department standard walls are used, the Design-Builder shall provide site specifics to the wall provider. Site specifics include, but are not limited to: profiles, wall heights, loading conditions (e.g. dead loads, live loads), results of foundation investigations, water conditions, all utilities (in-place, proposed, and future), site restrictions, expected wall cross section, and desirable wall face treatments. Any proposed pre-approved proprietary or alternate wall system will require prior approval from the Department. Walls types to be used at bridge abutments and/or approach embankments will also require prior approval.

The Design-Builder shall not use sheet pile, timber, or recycled material for permanent retaining walls or the retaining wall foundations.

The Design-Builder may use timber as temporary supports for soldier pile/tieback walls when a concrete facing is used.

Soil Nail and MSE walls shall not be used in front of the bridge abutments. For all retaining walls, total settlement and overall tolerances shall be based on site specific requirements. The Design-Builder shall not change or mix wall types within an uninterrupted wall segment. Wall types can be intermixed if the retaining wall and adjacent wingwall have the same architectural treatment facing.

13.4.2 Design Loads

The Design-Builder shall account for all applicable load cases including live load surcharges in accordance with provisions of AASHTO LRFD Bridge Design Specification. If the Design-Builder deviates from the standard plan load cases in anyway, the Design-Builder must follow the submittal process for a special design retaining wall system.

13.4.3 Plan Submittal and Approval

For retaining wall systems utilizing Standard Plans, the Design-Builder shall follow the submittal process as outlined in Section 11 “Roadways”. For retaining wall systems requiring special design, the Design-Builder is required to follow the submittal process as specified in Section 13.2.2 Structure Plan Submittals.

13.4.4 Geotechnical Requirements

The Design-Builder shall provide Geotechnical Design Reports and Foundation Reports for standard retaining walls. For nonstandard walls, the Design-Builder shall provide Preliminary Foundation Reports along with the Type Selection Report and Foundation Reports at the 65% Unchecked Structure Details

Submittal stage. The Preliminary Foundation Reports, Geotechnical Design Reports and Foundation Reports shall conform to Technical Provisions Section 8, "Geotechnical".

13.5 Specific Structure Scope

If there is a conflict between these bridge-specific requirements, approved geometrics and approved exceptions to highway design requirements, the latter governs.

13.5.1 GOVERNOR DRIVE UC (Widen), Bridge No. 57-0759L/R

13.5.1.1 Bridge scope and work

Widen the existing single span CIP/PS Box Girder bridges thereby closing the gap between the left and right structures. The structure description and general scope of work shall include the following:

- Design and construct abutments; the bridge structure shall match the existing span length of approximately 161 feet and shall be supported on Diaphragm type abutments on Spread Footings.
- Design and construct bridge superstructure; the superstructure shall be a single span CIP/PS box girder bridge. The median widening is approximately 28 feet and the structure depth shall be 6'-6".
- Remove the existing barrier railing Type 9 and overhang from both left and right edge of decks and construct Concrete Barrier Type 60 at the median between left and right bridge widening.
- Temporary railing (Type K) should be placed on the existing shoulder areas to separate the construction-working zone with the highway traffic.
- Design and construct Approach Slab Type N(30D) at both ends of the bridge.
- Existing minimum vertical clearance is 15'-3"±. For CIP/PS Box Girder superstructure, falsework is required. Superstructure is proposed to be cast above grade and lowered into place to meet minimum vertical clearance requirement.
- Underground gas line, water line, electrical line, sewer line and telephone line are present within the vicinity of the structure. Potholes are recommended to determine the exact location of these utility lines.

13.5.2 ROSE CANYON BRIDGE AND OVERHEAD (Widen), Bridge No. 57-0760L/R

13.5.2.1 Bridge scope and work

The existing three span , 8'0" deep RC BOX Girder bridges were built in 1969 and widened in 1999 using 6'-0" deep CIP/PS Box Girder. Widen existing bridges to the inside there by closing the gap between the left and right structures. The structure description and general scope of work shall include the following:

- Design and construct abutments and column piers/bent substructures; the superstructure shall be approximately 353' long and shall be supported on single column bents and seat type abutments.
- The widened structure shall be supported on Spread Footings at abutments and on large diameter CIDH piles on Bent locations.
- Design and construct bridge superstructure; the widened superstructure shall be three-span PC/PS Girder bridge. The median widening width is approximately 28 feet and the structure depth shall be minimum 6'-6" deep.
- Design and construct bridge superstructure: the proposed superstructure is three spans, 6'-6" deep PC/PS girders. The proposed median widening width is approximately 28 feet.

- Remove the existing barrier rails Type 9-11 and overhang from left and right bridges. Construct Type 60 Concrete Barrier railing at the median.
- Temporary railing Type K should be placed on the existing shoulder areas to separate the construction-working zone with the highway traffic.
- Design and construct Approach Slab Type N(30S) at both ends of the bridge.
- Power line, water line, and sewer lines are present within the vicinity of the structure. Potholes are recommended to determine the exact location of these utility lines. Refer to Section 6, "Utilities" for the Technical Provisions.

13.5.2.2 Design/Construction issues

- The Design Builder shall perform seismic study on the combined bridge structure, including both the existing bridge and widened bridge, and strengthen the existing bridge structure if required from the seismic study.
- Railroad Traffic will be carried through bridge construction area. The proposed Structure shall be designed in accordance with the most current policies, requirements and standards of the Railroad Agencies.
- Temporary Right of Entry and access on the railroad's property is required for construction. Design Builder shall obtain all necessary railroad approval of plans and specifications prior to preparing documents in the final form.
- The proposed structures need to be constructed in sequence to allow temporarily deactivating and activating power lines.

13.5.3 CARROLL CANYON DAR BOH, Bridge No. 57-DAR2

13.5.3.1 Bridge scope and work

Construct south facing Direct Access Ramps (DAR) Overhead Bridge at Carroll Canyon Road. The structure shall accommodate two-12 ft lanes, two-4 ft outside shoulders and 8 ft median and has an estimated total length of 482 feet. The bridge description and general scope of work shall include the following:

- Design and construct abutment and column piers/bent substructures; the superstructure is supported on single-column bents and seat-type abutment. The structure shall be supported on Large Diameter CIDH Piles with permanent steel casing at bents and piles footing at abutments.
- Design and construct bridge superstructure: the superstructure shall be a three-span CIP/PS box girder and the structural depth shall be 7'-3". The column section shall be square column with 1-ft by 1-ft chamfers at all exterior corners.
- The last span shall be supported on the newly built Carroll Canyon Road Bridge (Bridge No. 57C0786). The Design-Builder is advised to refer to Carroll Canyon Bridge (Bridge No. 57C0786) contract plans including change order documents and As-Built plans.
- Construct Concrete Barrier Type 60 at the median and Concrete Barrier Type 736 on edges of deck. Coordinate construction of new concrete barrier on edges of deck with concrete barriers installed by Carroll Canyon Road Bridge (Bridge No. 57C0786).
- Design and construct structure approach slab Type N(30S) at approach side of the bridge.

13.5.3.2 Design/Construction issues

- Coordinate with the adjacent Carroll Canyon Road Bridge (CCR Bridge) currently under construction, for design and construction of the proposed structure. Contract number for the CCR Bridge project is11-2T0404.
- Railroad traffic will be carried through bridge construction area. The proposed Structure shall be designed in accordance with the most current policies, requirements and standards of the Railroad Agencies.
- Based on Structures Preliminary Geotechnical Report, the soil layers at the site may be considered prone to liquefaction during earthquakes.
- Temporary Right of Entry and access on the railroad's property is required for construction. Design Builder shall obtain all necessary railroad approval of plans and specifications prior to preparing documents in the final form.

13.5.4 SOLEDAD CANYON BOH (Widen), Bridge No. 57-0787L/R

13.5.4.1 Bridge scope and work

Widen the existing Left and Right CIP/RC Box Girder bridges to the outside. This structure is formerly known as Carroll Canyon Bridge and Overhead. The existing six spans, 8'-6" deep, Left and Right Bridges were built in 1972 and retrofitted in 1998. The structure description and work include the following:

- Design and construct abutments and column piers/bent substructures; the left bridge superstructure shall be supported on multicolumn bents, the right bridge superstructure shall be supported on single column bents and both left and right structures shall be supported on diaphragm type abutments.
- The widened left and right structures shall be supported on Spread Footing at abutments and on large diameter CIDH piles with permanent steel casings on bent locations.
- Design and construct left bridge superstructures; the left bridge superstructure is six spans, 8'-6" deep, CIP/RC Box Girder Bridge and shall be widened to the outside by 52.5 feet minimum and varies.
- Design and construct right bridge superstructure; the right superstructure is six spans, 8'-6" deep, CIP/RC Box Girder Bridge and shall be widened to the outside by 44 feet minimum and varies.
- Remove the existing barrier railings Type 9-11 and overhang over outside edge of left and right bridge decks and construct Concrete Barrier Rail Type 736 at the outside widened edge of decks.
- Reconstruct existing box girder (outside bay) between Abutment 1 and Bent 2 for both left and right bridges. Coordinate with the proposed "CARROLL CANYON DAR WALLS" for bridge removal limits.
- Replace existing Type 9-11 barrier rail with Concrete Barrier Type 742 on the inside edge of decks. Refer to "SOLEDAD CANYON BR & OH (RECONSTRUCT), Bridge No. 5787R/L" As-Built plans.

13.5.4.2 Design/Construction issues

- Coordinate with the proposed "Carroll Canyon DAR" retaining walls for design and construction.
- Adjust the proposed Bent 5 skew (left bridge) to clear existing Carroll Canyon Road Bridge (BR # 57C0786).

- Temporary rail Type K needs to be placed on the existing shoulder area to separate the construction-working zone with the highway traffic.
- Power lines and sewer lines are present within the vicinity of the structure. Refer to Section "6 Utilities" for the Technical Provisions.
- Railroad Traffic will be carried through bridge construction area. There is a contract project by SANDBAG to add a new track, realign exiting track and construct a retaining wall and drainage system under the Soledad Canyon Bridge and Overhead. Refer to "Sorrento to Miramar- Phase 1" SANDAG Contract No. 1238901 for more information.
- The proposed structures shall be designed in accordance with the most current policies, requirements and standards of the Railroad Agencies.
- Temporary Right of Entry and access on the railroad's property is required for construction. Design Builder shall obtain all necessary railroad approval of plans and specifications prior to preparing documents in the final form.

13.5.5 CARROLL CANYON DAR WALLS, Bridge No. 57-NEW

13.5.5.1 Structure scope and work

Design and construct Direct Access Ramp (DAR) walls at Carroll Canyon Road. The structure description and work shall include the following:

- The earth-retaining structures shall have an estimated total length of 416 feet and maximum approximate wall height of 43 feet.
- The structure types shall be Tieback retaining wall and Standard Plan Type 1 walls.
- Construct Concrete Barriers Type 742 and Type 736 on top of walls and Concrete Barrier on the lower roadway.
- Coordinate design and construction of the concrete barriers on top of DAR walls with the proposed concrete barriers on Soledad Canyon Road Bridge (Bridge No. 57 0787R/L).
- The wall architectural treatment and detailing shall be consistent with those being constructed for the Carroll Canyon (DAR) Retaining Walls, (Bridge No. 57E0075/76) under Contract No. 11-2T040. For specific structure architectural treatment requirements, the Design-Builder's attention is directed to "Section 1***5*** – Visual Quality Management" of the Technical Provisions.

13.5.6 MIRA MESA BOULEVARD UC (Widen), Bridge No. 57-0785R

13.5.6.1 Bridge scope and work

Widen the existing single span CIP/PS Box Girder Bridge to the outside. The structure description and general scope of work shall include the following:

- Design and construct abutments; the bridge structure shall match the existing span length of approximately 167.33 feet and shall be supported on open end Diaphragm abutments on CIDH Piles.
- Design and construct bridge superstructure; the superstructure shall be a single span CIP/PS box girder bridge with structure depth 7'-0". The outside widening shall be approximately 32.75 feet.
- Remove the existing barrier railing Type 9 and overhang from right edge of deck and construct Concrete Barrier Rail Type 736 and concrete Barrier Type 60 modified at the outside widened edge of deck.

- Remove and rebuild existing Type 25 barrier rail as required for deck construction from existing Bridge Number 57-0785S left edge of deck.
- Temporary railing (Type K) should be placed on the existing shoulder areas to separate the construction-working zone with the highway traffic.
- Design and construct Approach Slab Type N(30D) at both ends of the bridge and as required reconstructing the northbound I-805 off ramp gore.
- Remove and replace existing slope paving in between existing Right bridge and Bridge number 57-0785S. Aesthetic treatments to match existing slope paving aesthetic treatments. For specific structure architectural treatment requirements, the Design-Builder's attention is directed to "Section 1***5*** – Visual Quality Management" of the Technical Provisions.

13.5.6.2 Design/Construction issues

- There is existing Tieback back wall under existing bridge at both abutment locations. Locate the proposed CIDH piles to avoid existing tiebacks. Exact Tieback locations shall be field verified.

13.6 Construction Requirements

13.6.1 Bracing

Temporary wind bracing shall be required during construction in accordance with the Department Standard Specifications.

13.6.2 Surface Finishes

All concrete surfaces shall receive a surface finish in accordance with the Standard Specifications and Visual Quality Management Plan. All steel surfaces shall be finished following the Department standard painting specifications found in the Caltrans *Standard Specifications for Construction* . Finish colors shall be selected during the Visual Quality Management Process outlined in Section 15.

13.6.3 Bridge Decks

Deck construction of bridges shall comply with the *Standard Specifications, the Bridge Deck Construction Manual, and Bridge Construction records and Procedures Manual*. A permanent point shall be marked on the exterior concrete barriers at the locations of columns or bents, and at the mid spans and each abutment. Locations of these points with their As-Built elevations shall be shown on the As-Built drawings.

13.6.4 Falsework

Each falsework construction shall be inspected before concrete placement by the Design-Builder's Licensed Engineer to certify in writing compliance with the approved drawings and certification that material used in construction of the falsework are adequate to support all loads and applied forces. Temporary bracing shall be provided during erection and removal of falsework and shown on the approved plans .

No adjustment of falsework grade or changes to any vertical or lateral component of falsework is allowed without the presence of the Design-Builder's Licensed Engineer.

Falsework shall not be adjusted, erected or removed over live traffic. Erection shall include all adjustments or removal of falsework components prior to concrete placement that contribute to the horizontal stability of the falsework system. Removal shall include lowering falsework, blowing sand from sand jacks, turning screws on screw jacks, and removing wedges.

Falsework over sidewalk or pedestrian walkways shall provide lighting, handrails and overhead cover with a width of not less than four(4) feet and extending ten (10) feet beyond the edges of deck.

In addition to the provisions in the Standard Specifications to allow for three (3) weeks for review of Falsework drawings by the Department after a completed submittal has been received with independent checked calculations by Design Builder, to allow for eight (8) weeks at all Railroad locations.

Falsework openings over highways and local streets shall provide a minimum width to allow for the number of traffic lanes which exist prior to construction plus Temporary K-Rail and three (3) inches clear, and at each location a minimum vertical clearance of 15'-0'' shall be provided for falsework openings. Temporary minimum horizontal and temporary minimum vertical construction clearances shall be shown on Falsework plans. For portions the Project impacting the Railroad, the Design-Builder shall comply with Railroad requirements stated in the C & M Agreement prior to the commencement of any Falsework construction.

13.6.5 Bridge Demolition

- Demolition plans shall be approved by a civil / structure engineer licensed in California.
- Demolition plans must show the location of the equipment(s) utilized for demolition, sequence of removal, equipment(s) - specifications including their weight, and any other material, which will be placed on the structure during or prior to demolition for all structures. A civil / structure engineer licensed in California must be present on site during demolition operation**.**
- Design-Builder shall stop work at locations where tests of samples from the locations determine that existing material is contaminated with "Asbestos" until the contaminated material is removed safely.

13.6.6 Source of supply for concrete

Aggregates used in concrete for this project shall be provided from sources which comply with the requirements of the "Surface Mining and Reclamation Act of 1975", and the Department approved list**.**

Attention is directed to Surface Mining and Reclamation Act of 1975, commencing in Public Resource Code, Mining and Geology, Section 2710, which establishes regulations pertinent to surface mining operations, and to California Public Contract Code Section 10295.5.

Material from mining operations furnished for this project shall only come from permitted sites in compliance with California Public Contract Code Section 10295.5.

13.7 Deliverables

13.7.1 Structure Construction Forms and Documents Required

The Design Builder shall submit the following completed forms and documents to the Department prior to beginning construction which can be included in the RFC package;

- Checked Joint Movement Calculations.
- 4-Scales and slope staking notes.
- Notes from Designers, and comment logs.
- Quantity Calculations for all types of materials to be incorporated
- Foundation Report.
- Temporary Easements or Utility Agreements.

- Survey Staking Control Notes.
- Prestressing shop drawings.
- Notice of Change in Clearance or Bridge Weight Rating, (Form TR-0019).
- Notice of Change in Vertical or Horizontal Clearance.
- Joint Movement calculations for type "B" seals and Joint Seal Assemblies.
- Column Guying plans.
- Falsework plans.
- Bridge demolition plans.

Other information requested by the Department to verify compliance.

The Design Builder shall submit the following completed forms and documents to the Department within sixty (60) days of the completion of each structure.

- Pile driving logs location at the completion of the operation for each location of bridges, retaining walls and sound walls.
- Report of falsework clearance, (Form DS-OSC 108).
- Cast In Drilled Holes (CIDH) Pile Quantity and Drilling Record.
- Test Result Summary sheet for couplers.
- Pre-Stressing Monitoring for concrete structures.
- Pre-Stressing Calibration Monitoring Sheet for concrete structures.
- Red lines Structures As-Built plans including Shop drawings.
- Final bridge deck profile.

The Design Builder shall provide the Department with completed final project files and Final As-Builts by Final Payment at the end of the project.

13.7.2 Mock-ups and Samples

Mock-ups and samples of textures, colors and construction methods will be required for all structure components for approval by the Department a minimum of 14 working days prior to construction. Approved mock-ups and samples will be used as a standard throughout construction.

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 the 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 otherwise specified herein or modified by Addendum or Change Order.

Landscape Standards

Priority	Agency	Title
1	Department	Highway Design Manual (HDM)
2	Department	Standard Specifications May 2006
3	Department	Standard Special Provisions
4	Department	Standard Plans 2006
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

Agency	*Title*
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.

14.2.3.2 Certified Arborist

The Design-Builder shall assign an International Society of Arboriculture Certified Arborist to the project with knowledge and experience in each of the following:

- Tree and shrub identification, inventory and plant appraisal methodology
- Tree protection measures
- Hazard tree identification and removal
- Identification of State of California-listed prohibited noxious weeds and restricted noxious weeds and the application of weed control or removal methods
- The Certified Arborist shall report directly to the Design-Builder's Landscape Architect.

14.2.4 Preliminary Engineering Plans

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

14.2.5 Software

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

14.2.6 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 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 the 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;
- Provide conduits for future irrigation systems; and
- Conforms to the District 11 Landscape and Irrigation Design Guidelines (Exhibit 14-A)

The Design-Builder shall select a project-wide aesthetic and landscape theme in conformance with the District 11 Landscape and Irrigation Design Guidelines. . Coordinate this theme with the local agencies and adjacent projects. Offer opportunity for agencies to sponsor betterments that compliment this theme. Coordinate with and gain approval of the Department for the proposed project theme. Select the best plants to meet the needs and requirements within each of the various planting areas. Consider the functionality and maintainability of the project planting and the total lifecycle cost. Plant material is to be selected to minimize maintenance, watering, fertilizing, and pruning requirements. Reduced frequency of maintenance, and access by and safety of maintenance personnel is a priority. Plant material shall be drought tolerant and conform to the requirements of the *Highway Design Manual*.

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

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

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 and shrubs within the construction limits and 200 feet beyond the limit.

- Vegetation Protection and Removal Plan. The removal plans shall show the location of all trees greater than 4" (caliper) and Environmentally Sensitive Areas. The removal plans shall clearly show trees to remain by identifying each tree or group of trees by quantity and species. Trees to remain shall be protected with temporary fencing per Section 14.4.1 "Vegetation Preservation". Removed trees and shrubs (except removed exotic plant materials) may be reduced to chips. Chipped material shall be spread within the project limits at locations designated by the Engineer.
- Vegetation Preservation Plan
- Weed Control Plan

These plans shall be submitted for the Department 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 the 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 approved list (see Exhibit A).

While the 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 the Department or other jurisdiction 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 or 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 Design Builder shall treat all disturbed slopes immediately after construction to reduce erosion.

Erosion Control Materials

- All above grade temporary and permanent erosion control measures such as fiber rolls, netting, rope, jute mesh, blankets to be biodegradable. Photodegradable plastics may not be used. Wood stakes are used for fiber rolls. Metal stakes may not be used.
- Fiber rolls and blankets shall be premanufactured consisting of either wood excelsior, rice or wheat straw, or coconut fibers or a combination of these materials. Fiber rolls and blankets to have a biodegradable netting of jute, sisal, or coir fiber.
- Erosion Control Hydraulic Mulch (Polymer Stabilized Fiber Matrix) or EC (PSFM) shall be applied to all disturber areas as permanent erosion control. Erosion Control Hydraulic Mulch (Bonded Fiber Matrix) shall be applied to slopes greater than 2:1 and all slopes with highly erodible soils. EC (PFSM) or EC(BFM) shall meet applicable rates per Department specifications; and shall include a seed mix consisting of native species with similar composition to those within the project area. See shall be produced in Southern California. Total Pure Live Seed shall be from 20-35 lbs/acre dependent on the slope ratio, slope aspect, soil fertility and soil erodability. A minimum of 8 species are required. A 2” layer of compost blanket shall be placed over the area immediately after hydroseeding. Mixes are subject to the approval of the Department.

14.3.6 Planting

The Design-Builder shall prepare a Planting plan indicating the location, species, size, and root condition of plants and details related to plant installation. The Planting plan shall be prepared by a California licensed Landscape Architect and shall demonstrate that the Landscape Design Concept can be implemented without conflict with other constructed improvements, above and below grade, existing or proposed.

The planting shall be designed with consideration to future maintenance requirements. Plant materials selected shall be drought tolerant, native and/or adapted species that have a proven track record of success in the region and are from the plant palette of the Visual Quality Manual. The Design-Builder shall coordinate with the Department to create an acceptable plant pallet that would prevent the spread or reintroduction of invasive plant species.

The Design Builder shall incorporate the following measures into landscape and revegetation plans:

- All native or sensitive habitats outside the permanent and temporary construction limits should be designated as Environmentally Sensitive Areas (ESAs) on project maps. ESAs should be temporarily fenced during construction with orange plastic snow fence. No personnel, equipment, or debris will be allowed within the ESAs,
- At Rose Canyon and Soledad Canyon, cut slopes shall be revegetated with native upland habitats with similar composition to those within the project area. Fill slopes and areas adjacent to wetlands and drainages shall be revegetated with appropriate native upland and wetland non-invasive species. The revegetated areas will be temporarily irrigated with an automatic, below grade system. Trees shall be on a separate bubbler system. Slopes 4:1 or greater will be planted with native container plants (trees and shrubs) and seed selected by the District Biologist and Landscape Architect. Trees and shrubs (minimum 1 gal size shrubs, and 5 gal size trees) to be planted at a minimum of one plant per 100 square feet of disturbed area. Plantings shall be 40% trees and 60% shrubs. There will be at least three years of plant establishment/maintenance on these slopes to control invasive seeds. All disturbed areas less than 4:1 will be stabilized by Erosion Control Hydraulic Mulch (Polymer Stabilized Fiber Matrix) containing appropriate native upland or wetland non-invasive species,
- Bioswales and detention basin locations are to be coordinated with District Design, Hydraulics, Storm Water Pollution Control specialist and Landscape Architect. Avoid placement of bioswales in landscape areas whenever possible,
- Bioswales and detention basins located near ESA's will be planted with appropriate native species. Biolswales and detention basins located adjacent to developed urban areas will be vegetated with native and drought tolerant non-invasive species,
- Proposed bioswale treatment may consist of native turf sod; container plantings from liners or flats; or native grasses from liners or flats overseeded with native plants. Plant species and application rates (density per square foot) to be approved by the District Landscape Architect, Biologist, and Storm Water Pollution Control Specialist. Bioswales shall be irrigated. Bioswale planting areas shall be prepared before installing fiber rolls and gravel bags by cultivation. Immediately prior to cultivation, soil amendment shall be added and thoroughly mixed into the soil. After cultivation is complete, fiber rolls and other permanent bmps shall be installed. After the irrigation systems have been installed and cultivation has been completed, no further planting work shall be done for a period of 21 days, except the soil shall be kept sufficiently moist to germinate weeds. Weeds that germinate shall be killed prior to planting,
- Disturbed areas resulting from grading and construction of the sound berm/wall shall be treated with Erosion Control (PSFM) per the above with a seed mix consisting of native species produced in southern California. Total Pure Live Seed shall be from 20-35 lbs/acre dependent on the slope ratio,

slope aspect, soil fertility and soil erodability. Seed Mixes shall contain a minimum of 8 species. Mixes are subject to the approval of the Department.

Recommended seed species include the following:

Castilleia exserta (Owl's Clover), Encelia californica (Bush Sunflower) Eriogonum fasciculatum var, fasciculatum (Flat-topped Buckwheat), Eriophyllum confertifiorum (Golden Yarrow), Eschscholzia californica (California Poppy), Lasthenia californica (Dwarf Goldfields), Leymus triticoides (Creeping Wildrye), Lotus scoparius (Deerwood), Nasella pulchra (Purple Needlegrass), Sisyrinchium bellum (Blue-eyed Grass) and Viguirea laciniata (San Diego Sunflower)

- Sound Berm/Noise Wall: A separate landscape contract will follow the Design Build project to install trees, shrubs, vines, groundcover and additional irrigation at the berm/wall as required by the Environmental Document.
- Duff from areas with coastal sage scrub and chaparral may be saved to aid in revegetating slopes with native species,
- Slopes adjacent to urban areas will be revegetated with native and drought tolerant non-invasive species selected by the District Landscape Architect and District Biologist

14.3.7 Irrigation

Irrigation systems and components shall be designed to sustain the planting while conserving water, minimizing maintenance and worker exposure to traffic. The design should be simple, efficient, straightforward, and should conform to local water conservation goals. Irrigation systems should be simple, easy to operate and maintain. Facilities need to be adjacent to the R/W, near access gates or adjacent to Maintenance Vehicle Pullouts or access roads. Reduce the number of irrigation components to the minimum to appropriately irrigate the area.

Standard, commercially available irrigation components should be used and special features should not be specified unless they are required to solve unique problems of the site. Specialized equipment and details would be required if irrigation systems are part of the District RICS Systems, if the system uses recycled water, and/or to conform to District 11 irrigation requirements.

The Design Builder shall design irrigation systems and use equipment to conform to District 11 Irrigation Guidelines listed in Exhibit 14-A.

The Design Builder shall provide irrigation systems to all new plantings and repair damage to existing irrigation systems as required by Section 14.4.2 Existing Irrigation Facilities.

The Design Builder shall be familiar with existing irrigation systems, live irrigation crossovers, and existing irrigation equipment in the vicinity of the project that may be impacted by construction. Design Builder shall check and test existing irrigation systems and construct necessary measures to maintain water supply to existing systems to remain prior to abandoning irrigation crossovers. Irrigation design shall included necessary measures such as temporary highlining, new water meters, extending existing crossovers, new crossovers, etc. to ensure a constant water supply to all irrigation systems within the project limits.

The Design Builder shall install (1) 2" water meter on the north side of SR805 at each side of Mira Mesa Blvd for irrigation of landscape areas in Department R/W. (2) meters total are required.

At each interchange, irrigation crossovers shall be used under roadways in locations that would accommodate the irrigation system (or future irrigation system as appropriate). Place two crossovers under mainline freeways, and one under each ramp. Use materials and installation methods meeting the requirements of Caltrans *Standard Specifications* and *Standard Plans* and Exhibit 14-A Irrigation Systems. The Design-Builder must coordinate with the Department on the final locations.

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 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. Trees within the construction footprint and outside of ESAs that have a biological or visual value shall be protected to the maximum extent possible. 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 maintain existing and new landscape elements during construction in accordance with the requirements in the Technical Provisions, Maintenance during Construction.

The Design Builder is directed to Section 7-1.11, "Preservation of Property," of the Standard Specifications and these provisions. Existing trees, shrubs and other plants that are not to be removed and are damaged by reason of the Design Builder's operations, shall be replaced by the Design Builder. The minimum size of tree replacement shall be 24" box and the minimum size of shrub replacement shall be No. 15 container. Replacement ground cover plants shall be from flats and shall be planted 12" on center.

Replacement planting shall conform to the requirements in Section 20-4.07, "Replacement," of the Standard Specifications. The Design Builder shall irrigate replacement plants in conformance with the provisions in Section 20-4.06, "Watering," of the Standard Specifications. Replacement planting of injured or damaged trees, shrubs, and other plants shall be completed prior to the start of the plant establishment period.

14.4.2 Existing Irrigation Facilities

The Design Builder shall maintain water supply and automatic irrigation to all existing irrigation systems during the life of the contract. Water supply and control systems cannot be disrupted.

Existing irrigation facilities that are to remain or to be relocated, and that are within those areas where clearing and grubbing or earthwork operations are to be performed, shall be checked for missing or damaged components and proper operation prior to performing clearing and grubbing or earthwork operations. Existing irrigation facilities outside of work areas that are affected by the constructing work shall also be checked for proper operations. The Design Builder shall correct deficiencies found by checking the existing facilities.

Locate existing irrigation water line crossovers and conduits prior to performing work on the irrigation system. Crossovers that will be impacted by construction shall be abandoned in place. Irrigation crossovers shall not be abandoned until their use is no longer required.

Abandoning irrigation crossovers shall conform to the following: Existing pull box, pavement marker, water line, electrical conduit and control neutral conductor wires shall be removed to 24" below finish grade and disposed of. The remaining water line and electrical conduit shall be capped. The ends of irrigation crossovers shall be securely closed.

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. Either repair irrigation crossovers or install new ones to maintain a constant water supply to existing irrigation systems.

New irrigation crossovers shall be installed at the NB off ramp and on ramp at Mira Sorrento Pl. A maintenance vehicle pullout shall be installed at the NB 805 to service the landscape area between the NB offramp and offramp at Mira Mesa Blvd near Mira Sorrento Pl.

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 the Department.

Weeds shall be killed and removed within proposed planting areas and within the area extending beyond the outer limits of the proposed planting areas to the adjacent edges of shoulders, dikes, curbs, sidewalks, walls, existing planting and fences. At those locations where proposed planting areas are 10 feet or more from the adjacent edges of shoulders, dikes, curbs, sidewalks, walls, and fences, the clearing limit shall be 6 feet beyond the outer limits of the proposed planting areas.

Weeds shall be killed and removed from within areas where textured paving, rock blankets and rock mulch are to be placed, and from within unpaved gore areas between the edge of pavement and planting areas.

Exotic plant species that are randomly dispersed throughout the exotic plant removal areas shown on the Weed Control plans shall be killed and removed. The exotic plant species to be killed and removed include but are not limited to aundo, pampas grass, fennel, tree tobacco, castor bean, artichoke thistle, fan palm and corpobrotus edulis.

Exotic plants shall be killed and removed as follows:

- All seed stalks and flower heads shall be bagged for disposal immediately after being removed and before transplant through the exotic plant removal areas,
- All above ground plant mass shall be cut and removed prior to removal of stumps, roots or rhizomes,
- Plant stumps, roots or rhizomes may be removed by chemical or manual means. Chemical and manual removal shall be performed as follows:
    A. Chemical removal shall include cutting plants off 2” above the ground and applying pesticide immediately (within one minute) to the cut,
    B. Manual removal shall include removing the entire root crown or mass and rhizomes. Plant or root pieces shall not be left in or on the soil following removal.
    C. Removed material shall be disposed of outside the highway right of way.

Weed control shall also conform to the following:

A. Stolon type weeds shall be killed with glyphosate,
B. Tumbleweeds shall be removed by hand pulling before the tumbleweeds reach a height of 150 mm,
C. Removed weeds shall be disposed of outside the highway right of way in conformance with the provisions in Section 7-1.13, “Disposal of Material Outside the Highway Right of Way,” of the Standard Specifications.

14.4.4 Plant Establishment

The Design-Builder shall follow ‘Plant Establishment’ as defined in *Caltrans Standards Specifications* and Standard Special Provisions. Plant Establishment shall be Type 2 for a period of 250 working days. Weeds within plant basins, native sod and groundcover areas shall be controlled by pulling. Weeds within mulch areas and outside of basins, sod and groundcover areas shall be controlled by killing. Weeds within pavement, curbs, sidewalks, textured paving, and other surfaced areas shall be controlled by killing.

Additional plant establishment work required by the Environmental Document shall be accomplished by a separate Department contract.

14.4.5 Final irrigation System Check

The Design Builder shall have full responsibility for making good or repairing defective work or materials found before formal written acceptance of the entire contract by the Department. Full compensation for checking irrigation systems shall be considered as included in the contract lump sum price.

14.5 Deliverables

14.5.1 Landscape Concept Plan

The Landscape Concept Plan shall include erosion control, planting, irrigation and miscellaneous roadside treatments and shall be submitted to the Department for approval within 60 Working Days after the landscape concept meeting. Landscape shall conform to the Department standards. Irrigation components are to be located and clustered in locations safely accessible for highway maintenance workers.

14.5.2 Vegetation and Landscape Plans

The Design-Builder shall prepare and submit to the Department, a Vegetation Protection and Removal Plan and landscape plans. These plans shall be submitted for the Department 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 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.

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 the 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

Prepare and submit a minimum of two pressure calculations for each irrigation water meter (point of connection) – one for the farthest valve station from the water source and one for the closest valve station. If a booster pump is required, provide pressure calculations for the valves close to the meter and pump.

Prepare and submit a water demand analysis from each point of connection. Night time watering is required after the first year of plant establishment (10-hour watering window), although it is encouraged at all times during the first year of plant establishment also.

If the combined cost for landscape work (planting and irrigation – excluding meters and crossovers) exceeds $200,000 then an Exception is required per Chapter 29 of the PDPM. The Design Builder shall prepare,

submit and receive approval for the "Fact Sheet Exceptions to Separate Contract Policy for Highway Planting Projects".

Prepare and submit Public Findings Statements (PFS) for all proprietary items such as specialized irrigation equipment. *Department/FHWA review and approval on all PFSs must be obtained before work is started.*

Prepare, submit and obtain approval for Irrigation Plans using recycled water are required by the City of San Diego and Department of Environmental Health.

- 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 the Department. Submittals shall be in a format acceptable to the Department and organized to facilitate review by the 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 the 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. The 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 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.

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EXHIBIT 14-A

District 11 Landscape and Irrigation Design Guidelines

This document is provided as an electronic file.

15 VISUAL QUALITY MANAGEMENT

15.1 General

The Design-Builder shall perform all work necessary to meet the requirements for visual quality management, including: provision of a Visual Quality Manager and Visual Quality Graphic Support Team; development and implementation of a Visual Quality Management Plan; ; and coordination with the Department Visual Quality Management Team, to ensure informed visual quality decisions and to produce an ongoing "Record of Recommendations and Decisions" document.

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

15.2 Administrative Requirements

15.2.1 Standards

The Design Builder shall design and construct the project 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 the Department before proceeding with design or construction.

Use the most current version of each listed standard as of the Request For Proposals (RFP) issue date unless otherwise specified herein or modified by Addendum or Change Order.

Visual Quality Management Standards

Priority	Agency	Title
1	Department	Highway Design Manual
2	Department	Project Development Procedures Manual,
3	Department	Office of Bridges and Structures, Aesthetic Guidelines for Bridge Design
4	AASHTO	A Policy on the Geometric Design of Highways and Streets
5	ASCE	Practical Highway Esthetics

15.2.2 References

Use the references listed below as supplementary guidelines for the design and construction of the Visual Quality treatment requirements. These publications have no established order of precedence.

Visual Quality Treatment References

Agency	Title
Department	Director's Policy No.22 Context Sensitive Solution
FHWA	Flexibility in Highway Design
Department	I-805 North Stage 1 Managed Lanes Visual Quality Manual

15.2.3 Aesthetic Themes and Concepts

The Aesthetic Themes and Concepts in the Reference Information Documents show only a preliminary aesthetic concept for the Project. This concept and the supporting files are included to illustrate the general scope of improvements. Verify all information prior to use.

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

15.2.4 Visual Quality Management Plan

The Design Builder shall assign a Visual Quality Manager to develop a Visual Quality Management Plan for the project defining the qualifications, responsibilities, and authority of the Visual Quality Manager; the responsibilities of the Visual Quality Management Graphic Support Team; the methods for coordinating and interacting with the Department Visual Quality Team; and the format and distribution of the ongoing Visual Quality "Record of Recommendations and Decisions" document.

15.2.4.1 Visual Quality Manager

15.2.4.1.1 Qualifications

See Book 2, Section 2.5.2.2.2. for requirements.

15.2.4.1.2 Responsibilities

The Visual Quality Manager shall have the responsibility to:

- Ddevelop and implement the Visual Quality Management Plan;
- Coordinate visual quality issues with the Department Visual Quality Team, Department, and the other members of the Design Builder's design and construction team; and
- Oversee the Visual Quality Graphic Support Team that will provide sketches, 2D or 3D CAD drawings, renderings, as needed to depict conceptual and detailed solutions to address visual quality issues.

15.2.4.1.3 Authority

The Visual Quality Manager shall have the authority to request from the Department Visual Quality Team, approval to deviate from the Visual Quality Manual. (The Visual Quality Manager and the Department Project Manager shall be the only parties to have this authority.) Review of deviations from the Visual Quality Manual by the Department Visual Quality Team and the Department may take up to 60 calendar Days to complete.

15.2.4.2 Methodology

15.2.4.2.1 Establishing a Visual Quality Team

The Visual Quality Team shall be assembled by the Department and shall consist of the following representatives:

- Caltrans District Landscape Architecture (Design)
- Caltrans District Landscape Architecture (Environmental)
- Others may be added as deemed necessary

15.2.4.2.2 Commitment to Context Sensitive Design and Solutions

The Design-Builder shall conduct Visual Quality Management Work consistent with the Department Policy on Context Sensitive Design and Solutions and the following principles:

- Balance safety, mobility, community, and environmental goals in all projects

- Involve the public and affected stakeholders early and continuously
- Address all modes of travel relevant to the project
- Use an interdisciplinary team tailored to project needs
- Apply flexibility inherent in design standards
- Incorporate visual quality considerations throughout project development

15.2.4.2.3 Producing a Visual Quality Management Plan

The Design-Builder shall produce a Visual Quality Management Plan in accordance with the requirements of this Section for approval within 60 days after issuance of NTP1.

The Visual Quality Management Plan shall:

- Establish the methods for coordinating and interacting with the Visual Quality Team. The plan shall define the methods to be employed for Visual Quality Issues that determine, define, and detail solutions for maintaining and enhancing existing visual quality;
- Define the involvement of the Visual Quality Manager and the Visual Quality Team in identifying areas or elements of the proposed bridge, roadway, and surroundings that present opportunities or concerns in the development of a visually acceptable design;
- Define the responsibilities and authority the Visual Quality Manager and the Visual Quality Team will have in overseeing and reviewing the overall bridge design, design details, mock-ups, samples, and other submittals relating to the development of a visually acceptable design;
- Define the authority of the Visual Quality Manager and the process for which the Visual Quality Manager will coordinate the input from the Visual Quality Team with other members of the Design Builder's design and construction team;
- Define what the process of producing the Record of Recommendations and Decisions will be throughout the Project; and
- Describe the process the Design-Builder will use to facilitate agreements in accordance with the Department cost sharing policies between the Department and local units of government to cover the costs of any architectural treatments or enhancements to visual quality elements in excess of the Department participation policy.

15.2.5 Software

The Design Builder shall use the latest version of Micro Station and CAiCE by Autodesk that the Department is using on the date of Final RFP. Concept plan preparation could use visual software such as Photoshop, SketchUp and -3D modeling.

15.2.6 Meetings

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

15.2.7 Visual Quality Concept Meeting

The Design Builder shall take an inventory of all the visual elements in the corridor (existing and under construction). The Design Builder shall schedule and participate in a Visual Quality

Concept meeting to present a layout of the in-place and proposed Visual Quality elements on the Project to the Visual Quality Team and the Department.

The Design Builder shall use the meeting to determine the permanent Visual Quality needs of the Project and begin development of the Visual Quality Concept.

15.3 Design Requirements

This section includes the design requirements for developing the design of Visual Quality elements (those elements that typically affect the visual quality of highway transportation projects) including:

- Visual Quality Concept: Prepare an initial aesthetics treatment plan based on the outcome of the Visual Quality Concept Meeting using the Visual Quality Manual (VQM), existing documents related to visual quality and criteria in this section. Submit for review by the Visual Quality Team and the Department.
- Visual Quality Plan: Develop a plan that integrates landscaping and aesthetic treatments from the approved Visual Quality Concept into the Visual Quality Plan. Design development to include conceptual drawings appropriate for each feature and landscape treatment.
- Design and Construction: Incorporate landscaping and aesthetic treatments from the approved Visual Quality Plan into the Project Release for Construction Documents and Project construction.

15.3.1 Visual Impact Assessment

The Design-Builder shall become familiar with existing documents related to visual quality including the "Visual Impact Assessment" and the "Visual/Aesthetics" Section of the Environmental Document for the I-805 Managed Lanes North Project; and the Architectural Elevations and Architectural Details in the 11-2T0404 Contract Documents for the Carroll Canyon (DAR) Retaining Walls (Bridge No. 57E0075/76) and Soledad Canyon BR & OH (Bridge No. 5787R/L").

The Design-Builder shall determine, document, and summarize the project specific Visual/Aesthetics elements and recommendation that will be incorporated into the Project. Please refer to Visual Quality Manual and the –"Avoidance, Minimization and/or Mitigation Measures' listed in the Visual Section of the Environmental Document.

The Design Builder shall follow the guidelines and requirements of the approved Visual Quality Management Plan, as well as aesthetics principles, requirements and strategies established for the Project design including the following:

- Choose a Project-wide aesthetic theme and coordinate and gain approval of this Project theme with the Visual Quality Team. All visual measures to be designed and implemented with the concurrence of the District Landscape Architect and Environmental Landscape Architecture Branch.
- The Project structural elements include, but are not limited to: all bridge components, retaining walls and noise walls. Paving includes colored and textured pavement.
- Consider the visual context when designing the aesthetic treatment of a structural element. Use aesthetic treatment that employ the use of color and texture, which can be further expressed by pattern reveals, bevels, shadow lines, surface finishes, pilasters and geometric form work.

The Design Builder shall incorporate the following elements when designing the aesthetics treatments for the Project:

- Consistency of signage, lighting, and architectural treatments
- Use of texture and color to define aesthetic treatments
- Views of structural elements (wall and bridges) from outside the right of way, intersections, and adjacent land uses.

- Ease of maintenance and repair
- Deterrence of vandalism and graffiti
- The interface of approach walls with bridge abutment and deck
- The shape and treatment of bents, abutments and retaining walls with form, reveals, color, and texture that relate to the other bridge elements and identify the bridge as part of the visual character of nearby structures

15.3.2 Visual Quality Manual

The Department has developed the Visual Quality Manual (VQM) for the Project, provided as Exhibit 15-A. The Design-Builder shall conduct all Work in accordance with the VQM.

The design recommendations contained in the VQM were developed to be consistent with the Visual/Aesthetic recommendations in the Environmental Document for the I-805 North Managed Lanes Project. Architectural treatment and detailing recommendation for the Carroll Canyon Direct Access Walls, Bridge (NEW) are consistent with those in the contract drawings for the Carroll Canyon (DAR) Retaining Walls (Bridge No. 57E0075/76) for the I-805 HOV/Carroll Canyon Road project Contract No. 11-2T0404 as well as proposed features of the Environmental Document.

The Design-Builder shall assume all provisions of the VQM, including the figures and tables, are mandatory. When the VQM refers to an action being "recommended" or "desirable," the Design-Builder shall construe the action as mandatory unless the context requires otherwise as determined by the Department in its sole discretion or unless otherwise provided. All words such as "should," "must," "is," and "may" shall mean "shall" unless the context requires otherwise, as determined in the sole discretion of the Department. The Design-Builder shall disregard qualifying words such as "usually," "normally," and "generally." It shall be in the Department sole discretion to determine when the context does not require a provision to be mandatory.

If it is not clear to the Design-Builder how the VQM should be interpreted, the Design-Builder shall have the obligation to raise the issue with the Department. Regardless of whether the Design-Builder raises the issue, the Department shall always have the right to notify the Design-Builder if the Design-Builder is interpreting the modification incorrectly.

The Design-Builder shall become familiar with existing documents, including the VQM, related to visual quality. The Design-Builder shall supplement any visual quality elements that are required to complete the project but are not described within the *Visual Quality Manual*. If needed, the Design-Builder shall submit a supplement to the Visual Quality Manual to specify the additional elements required.

15.3.3 Visual Quality Elements

The Visual Quality Manual defines the visual quality objectives the Design-Builder shall integrate into the Visual Quality Plans and the development of the Project.

This section applies to those elements of highway design that affect a corridor's visual quality. The Design-Builder shall consider all pertinent factors related to the people and place where the Project is located, including the physical context that provides a basis for visual character and the social context of values, culture, tradition, politics, and expectations that give a location meaning, meanings that cannot be understood without public involvement.

The Design-Builder shall design and build a Project, in accordance with the VQM, that responds to the Project's context and develop design solutions that maintain or enhance existing visual quality, so that all design solutions create visual harmony with the natural environment, visual order with the community setting, and design coherence within the highway corridor.

The Design-Builder shall develop designs for and build all Visual Quality elements of the Project in compliance with the visual quality goals and the conceptual design theme established in the *Visual Quality Manual*.

The Design-Builder shall design and construct all visual quality elements so that the experience of travelers and neighbors is visually harmonious, orderly, and coherent in accordance with the *Visual Quality Manual.*

The Visual Quality Manager, with advice and consent from the District Landscape Architect and the Department shall develop Released for Construction (RFC) plans for the Visual Quality Plans and Landscape Design Plans based on the requirements established by the *Visual Quality Manual.*

15.3.4 Visual Quality Management Plan

The Design Builder shall submit the Visual Quality Management Plan as defined in this provision for approval to the Visual Quality Team. The Design Builder shall develop and submit three (3) individually bound copies for approval by the Department. The Visual Quality Management Plan shall outline the methods to be employed for coordinating and interacting with the Visual Quality Team.

Within ten (10) Days of Approval, the Design Builder shall submit to the Department (3) color printed copies of the Approved Visual Quality Management Plan and (3) DVD copies in .pdf format. The cover of these copies shall have the words "Approved Visual Quality Management Plan," the name of the Design Builder, the name of the Project, and the date of Approval printed on them.

15.3.5 Visual Quality Concept

Submit the Visual Quality Concept within 60 Working Days after the Visual Quality Concept meeting for review by the Visual Quality Team and the Department. Review shall be for a period of 21 working days. Drawings shall comply in concept with the *Visual Quality Manual*. Conceptual drawings shall include plan, elevations, sections, special details and topography as appropriate for each feature. Conceptual drawings for Structures shall be approved by the Visual Quality Team and Department prior to Type Selection**.** Conceptual drawings for other items shall be approved by the District Landscape Architect, the Visual Quality Team, and Department prior to beginning work on construction drawings for any of these elements.

15.3.6 Record of Recommendations and Decisions

The Design Builder shall compile and maintain a "Record of Recommendations and Decisions" as determined by the Visual Quality Team. This is a "living" document that will serve as guidance to the Design Builder throughout the design and construction of the project with regard to visual quality and context sensitive design issues. The document will also signify the level of cooperation and collaboration between the Design Builder and the Visual Quality Team who represents the public regarding visual quality concerns and commitments. Copies of the updated "Record of Recommendations and Decisions" shall be distributed to the Visual Quality Team within 15 Days after revisions or additions occur.

15.3.7 Visual Quality Graphic Support

The Design Builder shall provide sketches, 2D and 3D CAD drawings and color renderings as necessary to adequately portray design and detail concepts or solutions to the Visual Quality Team. Because of the nature of this accelerated Project, the need for a number of graphics will be determined by the Design Builder's coordination with the Visual Quality Team. The need for and number of graphics shall not, for any reason be cause for a change or adjustment to the Contract Price or Contract Time.

15.3.8 Over-the-Shoulder Design Documents

During the landscape and architectural treatment/detailing 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 to the Department and organized to facilitate review by the Department.

15.4 Construction Requirements

15.4.1 General

Visual Quality consideration shall be integrated with all constructed elements of the project. Final plans used to construct the Project shall incorporate all landscaping and aesthetic treatments agreed upon by the Visual Quality Team and listed in the "Record of Recommendations and Decisions" and shown in the Visual Quality Plan

15.4.2 Visual Quality Mock-ups and Samples

The Design-Builder shall provide mock-ups and/or samples for the items as determined or recommended by the Visual Quality Team. Mock ups and/or samples include but are not limited to those described in Section 15.5. Mock-ups and/or samples Approved by the Department shall become the reference standard(s). The reference standard(s) shall be maintained undisturbed until Final Acceptance of the Project.

15.5 Deliverables

15.5.1 Visual Quality Plans and Landscape Design Plans

The Design-Builder shall provide RFC plans for the Visual Quality Plans and Landscape Design Plans for Acceptance by the Department.

15.5.2 Visual Quality Mock-ups and Samples

- The Design-Builder shall provide mock-ups or samples for approval by the Department, including mock-ups and samples as indicated by the Visual Quality Manual for: Architectural textures; random flute and variable sand blast finish including colored concrete
- Sound walls; block and grout samples
- Textured paving; rock blanket and exposed aggregate
- Stained or colored drainage features; stain or color
- Slope paving: color and finish

The Design Builder shall provide mock ups and samples a minimum of 14 working Days prior to the construction or installation of any of these elements.

EXHIBIT 15-A

I-805 North Phase 1 Visual Quality Manual

This document is provided as an electronic file.

16 SIGNING, PAVEMENT MARKING, SIGNALIZATION, AND LIGHTING

16.1 General

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

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

16.2 Administrative Requirements

16.2.1 Standards

16.2.1.1 General Standards

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

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

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

16.2.1.2 Permanent Signing Standards

Priority	Agency	Title
1.	Department	California Manual on Uniform Traffic Control Devices (CA MUTCD)
2.	Department	Highway Design Manual
3.	Department	Special Provisions and Non- Standard Special Provisions
4	Department	Standard Plans May 2006
5	Department	Design-Build Modifications to the Standard Specifications
6	Department	Standard Specifications May 2006
7	Department	California Sign Specifications
8	FHWA	Standard Highway Signs
9	Department	2011 HOV Guidelines for Planning, Design, and Operations
10	Various	Technical Memoranda and Preliminary Engineering Documents
11.	AASHTO	A Policy on Geometric Design of Highways and Streets
12.	AASHTO	Standard Specifications for Structural Support for Highway Signs, Luminaires, and Traffic Signals, 4th Edition with 2002, 2003, and 2006 Interims
13.	AASHTO	Roadside Design Guide
14.	Department	Plans Preparation Manual
15.	Department	CADD Users Manual

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 and Non- Standard Special Provisions
4	Department	Standard Plans May 2006
5	Department	Design-Build Modifications to the Standard Specifications
6	Department	Standard Specifications May 2006
7	Department	California Sign Specifications
8	FHWA	Standard Highway Signs
9	Department	2011 HOV Guidelines for Planning, Design, and Operations
10	Various	Technical Memoranda and Preliminary Engineering Documents
11	AASHTO	A Policy on Geometric Design of Highways and Streets
12	AASHTO	Roadside Design Guide
13	Department	Plans Preparation Manual
14	Department	CADD Users Manual

16.2.1.4 Traffic Signal Standards

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

16.2.1.5 Permanent Lighting Standards

Priority	Agency	Title
1.	Department	Roadway Lighting Design Manual
2.	Department	CADD Data Standards (Lighting Cell Library)
3.	Department	Signal and Lighting Guidelines
4.	Department	Special Provisions and Non- Standard Special Provisions
5.	Department	Standard Plans 2006
6.	Department	Design-Build Modifications to the Standard Specifications
7.	Department	Standard Specifications May 2006
8.	Various	Technical Memoranda and Preliminary Engineering Documents
9	Department	Traffic Manual
9.	Department	Plans Preparation Manual
10.	ANSI	Illuminating Engineering Society of North America Roadway Lighting ANSI Approved RP-8-00
11.	AASHTO	Roadway Lighting Design Guide

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
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
Department	Ramp Meter Design Manual
Department	Post Mile Log
Department	California Log of Bridges on State Highways
Department	Traffic Handling Plan Guidelines
Department	California Numbered Exit Uniform System (**Cal**-**NExUS**)
DMV	California Vehicle Code
NEPA	National Electric Code

16.2.3 Local Road System

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

16.2.4 Preliminary Engineering Documents

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

The Design-Builder shall have the flexibility to make Project changes without impairing the essential functions and characteristics of the Project, such as safety, traffic operations, durability, desired appearance, maintainability, environmental protection, drainage, and other permitted constraints; provided that the Design-Builder shall perform the Work in accordance with the Standards and Requirements set forth in these Technical Provisions unless the Design-Builder obtains a deviation or Exception of those Standards or Requirements in accordance with the design review process set forth in the Design Build Contract.

16.2.5 Software Requirements

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

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

16.2.6 Meetings

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, Pavement Marking, and Signalization Work during the design and construction stages. The requesting entity shall provide the other parties with not less than five (5) days prior notice of such meetings. The Design-Builder shall prepare and distribute within five (5) days of the meeting a record of the minutes to the meeting.

16.2.6.1 Permanent Signing Meetings

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

16.2.7 Coordination with Other Agencies and Disciplines

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

16.2.8 Certification Requirements

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

16.3 Design Requirements

16.3.1 Permanent and Temporary 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:

- Comply with State requirements for all temporary and permanent traffic control devices.
- Provide for the orderly and predictable movement of all traffic, including bicycles and pedestrians.
- Provide such guidance and warnings as are needed to ensure the safe and informed operation of individual elements of the traffic stream.

Preliminary traffic sign plans must be submitted with 30% design plans. The Design-Builder must get Approval from the Department for all signing plans.

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

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

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

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

16.3.1.2 Signing Plan Requirements

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

- Provide for modification of any signage outside the Planned Right of Way limits that is rendered inaccurate, ineffective, confusing, or unnecessary by the Project. Such modifications may include the addition, resetting, relocation or removal, or replacement of signs and appurtenances.
- 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 signs during all phases of construction as appropriate.
- Replace all existing signs within the Planned Right of Way and Project limits that do not meet current standards and as necessary with concurrence of the Department.
- All off-ramps must have intersection lane control signing (on both sides of the off-ramp for multiple lanes) for temporary (that exist for more than seven days) and permanent off-ramp lane configurations at the beginning of the turn lanes and at the intersection (mast arm mounted where possible)
- The Signing plan shall provide for modifications to signage outside the Planned Right of Way limits that are rendered inaccurate, ineffective, confusing, or unnecessary by the Project. This includes signs on roadways inside and outside the Planned Right of Way limits. Guide signs include route marker assemblies, directional, distance, and information signs. The modifications shall include the addition resetting, relocation or removal, or alteration of signs and appurtenances.
- Include all necessary 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 accordance with the requirements of the CA MUTCD and in such a manner that they do not conflict with other signs, vegetation, or structures and are clearly visible according to CA MUTCD standards.

- The Design-Builder shall design and install guide signs and Trailblazer Signs outside of the final right of way for the Project. The scope of the Work for signs located outside of the final right of way includes new signs and modifications to existing sign panels and structures.
- The Design-Builder will install signs located outside of the final right of way in existing rights-of-way controlled by other local agencies. The Design-Builder shall coordinate with the applicable local agency for the design and installation of the guide and trailblazer signs outside of the final right of way.
- The Design-Builder shall replace any existing signs within the project area that do not meet retroreflectivity requirements as defined in the CA MUTCD.
- Temporary signs placed during construction shall not block pedestrian or bicycle paths, routes, or lanes, unless suitable alternative routes are provided

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

- Sign Plan Sheets
- Sign Quantity Plan Sheets
- Sign Detail Plan Sheets
- Construction Area Sign Plan Sheets
- Temporary Traffic Control Plan Sheets
- Proximity to Intelligent Transportation System (ITS) devices, including Changeable Message Sign (CMS) locations

16.3.1.3 Material Requirements

Traffic signs shall be constructed in accordance with the provisions of CA MUTCD, *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 Specifications*;
- The Design-Builder shall not reuse any existing sign materials as part of the permanent signing installation and shall dispose off the project site all removed signing materials and structures.

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

The Design-Builder shall provide signing materials that:

- Shall meet the standards for retro-reflective panels.
- Shall meet standard text size, border, legend, color, material and fabrication. The use of substandard (smaller) text size is not acceptable. The sign panel shall be designed to accommodate the standard legend and border.
- Shall include exit numbers in the sign with the legend per the Department requirements.
- English units shall be used.
- All Rail Mounted Sign Details shall be approved by the Engineering Department Traffic Design Engineer.
- Shall include Premium Anti-Graffiti Sheeting.

16.3.1.5. Overhead Sign Structures

16.3.1.5.1 Existing Overhead Sign Structures

All existing overhead signs structures shall meet the following requirements:

- Overhead sign structures shall be evaluated for adequate strength per American Association of State Highway and Transportation Officials (AASHTO) and Department standards. Sign structures found to have inadequate strength shall be replaced with new sign structures.
- Overhead sign structures located in the mainline median shall be replaced with new signs.
- Overhead sign structures with posts/foundations on the mainline or ramps that are fixed objects shall be identified and corrected to meet design current standards.

16.3.1.5.2. New Overhead Sign Structures

All new overhead sign structures shall meet the following standards:

- Overhead sign structures shall be of truss, lightweight, or bridge mounted type as appropriate..
- Overhead sign structures shall be designed for fully loaded conditions and per the Department requirements.
- Overhead sign structures shall conform to the Department welding requirements.
- Overhead sign structures shall have a minimum vertical clearance of 18 feet over the entire length of the pavement and shoulder.
- Overhead sign structures shall be illuminated if structure is a guide sign or combination of HOV and guide signs.

Roadside signs shall be mounted on wood posts; except for rail-mounted signs, Structure mounted signs and Barrier mounted signs.

16.3.1.6. Sign Design

Design Overhead signs that meet the following requirements:

- Illumination: Externally illuminated with HPS lamps, per Performance Specification for Lighting.

16.3.2 Pavement Marking

Temporary and permanent pavement delineation Work shall include designing, installing, modifying, or removing striping and pavement markings. The Design-Builder shall prepare pavement delineation plans that show HOV striping, edge striping, lane line striping, arrows, legends, pavement markings, roadway delineators and the removal of such, and marking removals consistent with the needs of the project. 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:

- Comply with requirements defined in the CA MUTCD.
- Provide for the orderly and predictable movement of all traffic, including bicycles and pedestrians.
- 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.

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 Engineering Department Traffic Design Engineer. 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 Meetings

The Design-Builder shall take an inventory of all existing pavement striping, markings, and roadway delineators in the Project. The Design-Builder shall schedule one or more pavement delineation concept meeting(s) 30 Days after NTP1 to present a sketched layout of the existing pavement striping, markings, and roadway delineators on the Project to the Department. The Design-Builder shall use the meeting to determine the permanent pavement delineation needs of the Project.

16.3.2.3 Pavement Delineation Plans

The pavement delineation plans - shall include the following:

- Pavement Delineation Plan Sheets
- Pavement Delineation Quantity Sheets
- Pavement Delineation Detail Sheets
- Temporary Pavement Delineation Plans shall be included in the Stage Construction Plan Sheets or the Traffic Control Plans.

16.3.2.4 Pavement Delineation Material Requirements

The Design-Builder shall provide permanent or temporary pavement delineation that meets Caltrans Standard Specifications. All permanent striping and pavement markings shall be thermoplastic conforming to SSP #84-050. Thermoplastic Traffic Stripe and Pavement Markings shall have a minimum thickness of 0.098 Inch and a minimum application rate of 0.34 (lb/ft). All Markers shall conform to Caltrans Standard Plans.

16.3.3 Permanent and Temporary Signalization

Design, furnish, and install all components of a signal system necessary to provide a complete and functional system that meets the following performance requirements. Design and construct the traffic signal system, using the criteria specified within this Section. The installed traffic signals will:

- Comply with requirements defined in the CA MUTCD
- Provide for the orderly and predictable movement of all traffic, including bicycles and pedestrians..
- Provide such guidance and warnings as are needed to ensure the safe and informed operation of individual elements of the traffic stream.
- Accommodate pedestrians and bicyclists as required by the CA MUTCD, the federal MUTCD and other applicable laws, Caltrans Policy Directives, etc .
- Be fully tested and documented as meeting the Contract requirements..
- The Design-Builder shall design and install warranted and/or otherwise required traffic signals or portions of traffic signals, both permanent and temporary. The Design-Builder, as required, shall also design and implement modifications to existing traffic signals as a result of the Final Design. The traffic signal designs and modifications shall be completed in accordance with the current the Department standards.
- The Design-Builder shall make existing signal systems compatible with any of the proposed interconnections. As part of the interconnection, the Design-Builder shall provide any modem

connections and telephone access needed to communicate with these signal systems. The Design-Builder will be responsible for all costs associated with these connections.

- Provide temporary lighting for any location that currently has lighting and temporary traffic signals at any location that currently has traffic signals and that are removed for roadway construction or locations that are required to facilitate maintenance of traffic.
- The Design-Builder is responsible for designing and implementing any temporary traffic signal timing or for any phasing required for traffic management during construction. Submit any proposed timing or phasing changes, including any temporary signal head placement, to the Department for review and concurrence at least 15 days in advance. The Design-Builder is responsible for all work to implement the approved temporary changes, including programming the controller and relocating signal heads. Provide 24-hour notice for the Department inspection prior to implementing temporary phasing.

16.3.4 Signalization

The Design-Builder shall provide, implement and fine-tune signal timing plans for all new signals, modified signals and interconnected signals.

16.3.4.1 Signal Design and Operational Analysis

Prepare signal design Plans and operational timing Plans. Conduct traffic signal warrant analyses at all locations where a traffic signal is proposed and does not currently exist. Develop traffic data required for the warrant analysis.

Include documentation establishing the basis of designs of new and replacement traffic signals, signal timing methodology, and capacity and traffic level of service (LOS) analysis. Include appropriate supporting calculations.

16.3.5 Traffic Signal Design

Design intersections and traffic signals that optimize vehicle level of service, minimize delay, and accommodate pedestrians as necessary. Base design and analysis on the Planned Right of Way Limits. If the Design-Builder determines, in its preliminary studies, that the levels of service for year of operation (2015) and design year (2035) cannot be achieved within the defined Planned Right of Way Limits, advise the Department and/or local agency and recommend proposed solutions. The Department and/or local agency will evaluate the proposed solutions with the Design-Builder by assessing the cost, time, and impacts of acquisition of additional right of way, and determine whether to proceed with any proposed solution.

The design, operations, timing requirements, interconnection, etc. shall be coordinated with jurisdictions operating traffic signals adjacent to the Planned Right of Way Limits.

Include the means to optimize and coordinate the complex traffic flow through closely spaced signals at the interchange areas in all traffic signal designs. For example, such designs may include traffic responsive operation and/or the use of queue detection on the freeway off ramp and on the surface street.

16.3.5.1 Traffic Analysis Methodology

Calculate traffic for individual intersection capacity based on the 2000 Highway Capacity Manual. Determine optimal traffic signal timing for a group of closely spaced intersections based on a computer simulation or optimization model.

The following traffic signal analysis programs and techniques are typically used by the Department. Although use of these specific computer programs will not be required, the use of other programs and techniques must be approved in advance.

- Traffic signal capacity, cycle length, split timing, and level of service: Synchro, HCM/Cinema 3.0;
- Traffic signal coordination timing, including optimal cycle length, phase sequence, and offsets: Synchro; and

- Complex signal coordination, queuing, and turn bay storage: SimTraffic, CORSIM, VISSIM.

16.3.5.2 Traffic Analysis for Maintenance of Traffic

The purpose of the MOT traffic analysis is to document the adequacy of the traffic signal system, roadway geometry, and lane configuration during construction.

Include traffic analysis of proposed changes to individual intersections including traffic capacity and level of service analysis for the weekday a.m. and p.m. peak hours. Conduct traffic signal coordination and queuing analyses for construction conditions to document that intersection spacing and turn bay lengths are adequate to avoid queuing problems that would degrade level of service.

16.3.5.3 Traffic Analysis for Year of Operation (2015)

For the purpose of traffic analysis related to signals, the year of operation is defined as 2015, by which time all Project components will be completed and in service.

Include the development of all traffic signal phase sequence and timing parameters necessary to provide optimal signal operation during all hours of the day. Include 2015 capacity and signal coordination calculations in the analysis. While the analysis is based on the year 2015, implement cohesive system portions at the earliest opportunity.

Prepare the complete database required to program controllers for new and replacement signals, including:

- Phase data, including minimum green, maximum green, extension, yellow, all-red, and pedestrian timing;
- Detector parameters;
- Time-of-day, day-of-week, and week-of-year plan selection;
- Cycle length;
- Splits and phase sequences;
- Offsets;
- System detector volume and occupancy weighing;
- Traffic responsive plan selection criteria; and
- Pre-emption timing parameters.

Include timing Plans and coordination of all signals within 1/2 mile of new or replacement traffic signals. Coordinate timing Plans with adjacent intersections and arterials outside of the 1/2 mile limit to provide optimal traffic flow through the interchange area. Recommend to the Department and/or local agency changes to signal coordination timing parameters at locations where changes may improve the traffic operations. Supply timing Plans, including:

- Time of day, day of week, and week of year plan selection;
- Cycle length;
- Splits and phase modes;
- Offsets;
- System detector volume and occupancy weighing; and
- Traffic responsive plan selection criteria.

Program all traffic control equipment for new and replacement traffic signals and provide all additional timing plans and coordination parameters. All timing and coordination data will be reviewed and adjusted, if

necessary, by the Department and/or local agency prior to turn on of new traffic signals. Following the turn on of new traffic signals, conduct an operational check and fine tuning of the traffic signal timing.

16.3.5.4 Traffic Analysis For the Design Year (2035)

The purpose of the design year traffic analysis is to document the adequacy of the traffic signal system, roadway geometry, and lane configuration for the design year. Traffic analysis of individual intersections shall include traffic capacity and level of service analysis for the weekday a.m. and p.m. peak hours.

Conduct traffic signal coordination and queuing analyses for the design year to document that intersection spacing and turn bay lengths are adequate to avoid queuing problems that would degrade level of service.

16.3.5.5 Electrical Service

Intersection safety lighting shall be designed and constructed in accordance with the Department Street Lighting standards and specifications.

Service for all elements except for highway lighting and sign illumination shall be standard 120/240-volt (V) service. The Design-Builder shall be responsible for obtaining new or modified electrical service and telephone service points, including all applications and permits required from the serving utility company, and XY standard forms in the case of new telephone services. The Design-Builder shall refer to the utilities section in the technical provisions for utility requirements.

Separate service conduits shall be used for traffic signals, lighting circuits, Traffic Monitoring Systems (TMS), Ramp Metering Systems (RMS), Closed Circuit Television (CCTV), and from the service cabinet meter to the load. Large conduits with inner ducts to route the conductors for these separate circuits will not be acceptable.

The Design-Builder shall be responsible for all electrical utility costs of the new or modified system, unless otherwise stated, following any change in loading on an existing meter, relocation of a meter, or installation of a new meter. This responsibility shall continue until Project Final Acceptance.

The Department shall pay for existing power for the mainline and ramp lighting as long as the existing lighting is in use. Notify the Department at least seven calendar days before disconnecting the existing lighting from power. At each location where temporary lighting will be provided, the Design-Builder shall pay the temporary lighting costs until the final lighting facilities are in place and have been accepted. The Department will then resume payment responsibility for power for lighting.

The municipalities (local agencies) shall pay for power for lighting at the signalized intersections. The Design-Builder shall notify them at least seven calendar days before disconnecting the power. The Design-Builder shall provide temporary lighting for each signalized intersection and pay the temporary lighting costs until the final lighting facilities are in place and have been accepted. The municipalities will then resume payment responsibility for power for lighting.

16.3.6 Electrical Design

16.3.6.1 Electrical Design Concept Meeting

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

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

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

- Existing electrical systems shall be shown.
- Identified power sources shall be shown on the plans clearly indicating the respective source locations (regardless of the design segment). Terminated conduit run with the note "service location as part of other segment" will not be acceptable.

- Equipment numbers shall correspond to their post mile location. Northbound numbering shall be even numbered.

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

- Ramp meters
- Traffic monitoring stations
- CCTV
- Fiber optic (F/O*)* data node
- Fiber Optic video node
- Irrigation
- • Highway safety lightings
- • Photoelectric controls

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

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

16.3.6.2 Traffic Signal Design Requirements

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

16.3.6.3 Specific Requirements

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

Existing ramp meters shall remain active during all stages of construction. Disruption of electrical or communications services shall not be allowed. Ramp and main lane detection shall be available at all times.

16.3.7 Permanent Lighting

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

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

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

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

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

16.3.7.1 Lighting Concept Meeting

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

The Design-Builder shall use the outcome of the meeting to finalize the lighting system needs of the Project.

16.3.7.2 Photometric Analysis

The Design-Builder shall complete a Photometric Analysis that includes the following:

- Lighting intensities and uniformity, light pole locations and heights, luminaire types, wattage and brightness, and quantities of each
- Lighting calculations accounting for the anticipated loss of light due to lamp lumen depreciation (LLD) and lamp dirt depreciation (LDD)
- When adjacent to residential areas, the maximum spillover lighting allowed shall be 0.2 foot-candles at ground level on residential properties
- Consideration of roadway safety, ease and cost of maintenance, cost of construction, consistency with adjacent roadway lighting designs, annual energy costs, and provision for future lighting needs and local planning policies
- Lighting distances from the light source at the following lighting levels: 1.0 foot-candle, 0.5 foot-candle, and 0.2 foot-candle for all edges of pavements, shoulder lines, lane lines, Right of Way, and 150 feet outside of Right of Way

The Design-Builder shall consider, butis not be 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 Lighting Under Structures

The Design-Builder shall provide understructure lighting for all structures (except box culverts) within the Project limits.

The Design-Builder shall provide lighting that is consistent with the luminance levels and uniformity of the surrounding lighting system.

The Design-Builder shall design, furnish, and construct all understructure lighting to eliminate the need for lane closures during post-construction maintenance and shall locate luminaires to reduce the likelihood of tampering and damage by vandals.

Levels of illumination required under bridges shall be a minimum of 4.0 foot-candles measured horizontally on the surface of the walkway and vertically at a height of 6 feet above finished grade, with an average to minimum illumination uniformity ratio of 3:1.

16.3.7.4 Spillover Light

The Design-Builder shall limit spillover lighting outside of the Planned Right of Way limits.

16.3.7.5 Specific Requirements

When encountering a retaining wall during placement of the lighting poles, the Design-Builder shall mount the pole on the retaining wall and adjust the length of the pole to maintain the appropriate mounting height.

During the course of the Contract, the Design-Builder shall respond to complaints of residents adjacent to the Project and take necessary measures to mitigate any issues resulting from the new lighting system.

. The Design-Builder shall 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 [NOT USED]

16.3.7.7 [NOT USED]

16.3.7.8 Arterial Streets and Frontage Roads

Provide lighting on signalized intersections located on all arterial streets, and frontage roads within the Project limits. Provide standard roadway luminaire on signal pole extensions at each corner of signalized intersections. Replace-in-kind and supplement, as appropriate, any existing roadway lighting affected by Project construction to meet the requirements of the roadway configuration

16.3.7.9 Sign Lighting

Provide a fused disconnect switch for ease of maintenance. Mount disconnect switch on the sign structure pole. Make wire splices in the junction box, or the splice box located behind the sign. Wire splices within the sign structure are not acceptable.

16.3.8 Electrical Design

16.3.8.1 Electrical Design Concept Meeting

The Design-Builder shall take an inventory of all the existing electrical elements in the Project. The Design-Builder shall schedule and participate in an Electrical concept meeting to present a layout of the in-place and proposed Electrical systems on the Project to the Department. Electrical design plans for all electrical design systems shall conform to the following requirements:

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

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

- Traffic monitoring stations
- Highway safety lightings

A separate electrical service meter in a service cabinet shall be provided for changeable message sign (CMS) and communication hubs. All appurtenances shall comply with the horizontal clearance requirements in the Highway Design Manual.

16.4 Construction Requirements

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

The Design-Builder shall use Materials listed on the Department Approved Products List for Work Zones and Signals. The Design-Builder shall obtain the current Approved Products List.

The Design-Builder shall make appropriate arrangements with the electric company for installation or relocation of power service.

16.4.1 Permanent Signing

The Design-Builder shall mark in the field locations of the proposed signs and conduct a construction design review with the Department before installation.

The Design-Builder shall obtain the Department acceptance of all sign locations in the field prior to installation.

16.4.1.1 Salvage

The Design-Builder shall provide a Salvaging Material Plan. The plan shall show materials to be salvaged and reused. All other material to be removed that is not reused or salvaged shall become the property of the Design-Builder and shall be removed from the freeway right of way in conformance with the Standard Specifications. Approval of the Salvaging Material Plan is required. The Design-Builder shall receive a response within 15 days.

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 Permanent Signalization

The Design-Builder shall be responsible for locating and marking all underground utilities prior to any signal installation work.

The Design-Builder shall provide maintenance for permanent or temporary signalization installations within the project limits until Final Acceptance of the Project.

16.4.3.1 Source of Power

The Design-Builder shall coordinate with the local power supplier to provide the power service connection. The Design-Builder shall pay all costs, unless otherwise noted, charged by the electric power companies for providing power connections. The Design-Builder shall be responsible for contacting the electric utility to determine the source of power, to obtain exact locations of power poles and stub-outs for the permanent and temporary installations.

16.4.3.2 State Furnished Materials

The following traffic signal material will be furnished by the Department and installed by the Design-Builder:

- Controllers;
- Controller cabinets;

The Design-Builder shall submit a request for State Furnished Material listing the type and number of signal materials at least 120 days prior to the date when the materials are required. The Department will place the order with the manufacturer, drop ship to the desired location and contact provided by the Design-Builder.

16.4.4 Permanent Lighting

Temporary lighting is required to be installed and operational prior to removal of the existing lighting systems and during false work installation.

16.4.4.1 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 will receive a response within 15 days.

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. Design-Builder shall make no changes in any approved shop drawing after approval has been received. Any deviations from approved shop drawings shall require that the Design-Builder submit revised shop drawings back for their approval.

Shop drawings for lighting structures and for Overhead sign structures shall be submitted for Acceptance prior to fabrication.

16.5.8 Design Justification Reports and Project Documentation

Upon request, the Design-Builder shall submit design justifications when the Design-Builder shall consider various factors or alternatives. Documentation may be computer generated or hand written and shall clearly identify the following:

- Design issue
- Items requiring consideration
- Basis for evaluation
- Final decision and justification

16.5.9 Non- Standard Specifications and Non- Standard Special Provisions

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

16.5.10 As-Built Documents

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

17 INTELLIGENT TRANSPORTATION SYSTEMS (ITS)

17.1 General

The Design-Builder shall perform all Work necessary to meet the requirements for Intelligent Transportation Systems (ITS) and ITS system elements. ITS system elements included but are not limited to Ramp Meters (RM), Vehicle Detection Stations (VDS), Changeable Message Signs (CMS), Closed Circuit Television cameras (CCTV), Traffic Signals, Fiber Optic system (F/O), back-office and communication system components of the aforementioned ITS system elements. [The Design Builder shall take an inventory of all the existing ITS system elements in the Project. The Design Builder shall design and construct the Work of relocating and modifying the existing ITS elements shown in the Preliminary Engineering Documents.] The scope of ITS Work shall include system planning, design, furnishing, installation, modifying, integration, testing, interim maintenance including maintaining any existing ITS system elements operational or providing temporary replacements during construction, and system acceptance of the ITS and ITS system elements.

The Design Builder shall coordinate with the Department to ensure that the appropriate design methods, procedures, submittals, plan preparation, analysis methodology, review/comment processes, approval procedures, specifications and construction requirements are met for ITS work within the Project.

17.2 Administrative Requirements

17.2.1 Standards

The Design Builder shall perform the Work in accordance with the requirements of the standards listed by priority below

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

If there is any unresolved ambiguity in standards, it is the Design-Builder's responsibility to obtain clarification before proceeding with design and/or construction. Use the most current version of each listed standard as of the Request For Proposals (RFP)issue date unless otherwise 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)
2	Department	Traffic Manual
3	Department	District Electrical Details
4	Department	Standard Plans May 2006
5	Department	Design Build Modifications to the Standard Specifications for Construction
6	Department	Standard Specifications May 2006
7	Department	Highway Design Manual
8	Department	Construction Manual
9	Department	Technical Memoranda
10	Department	Plans Preparation Manual
11	AASHTO	Roadside Design Guide

12	Department	Ramp Metering Design Guide
13	Department	Fiber Optic System Design Guide
14	Department	Changeable Message Sign Guidelines

17.2.2 Reference Information Documents

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)
Department	Maintaining Transportation Management System Field Elements during Construction
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

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 Preliminary Engineering Documents

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

The Design Builder shall have the flexibility to make Project changes without impairing the essential functions and characteristics of the Project, such as safety, traffic operations, durability, desired appearance, maintainability, environmental protection, drainage, and other permitted constraints; provided that the Design Builder shall perform the Work in accordance with the Standards and Requirements set forth in these Technical Provisions unless the Design Builder obtains a deviation or Exception to those Standards or Requirements in accordance with the design review process set forth in the Design Build Contract (Book 1).

17.2.4 Software Requirements

The Design Builder may at its own discretion use any software when submitting plans for approval but shall prepare the final drawings using MicroStation SE and CAiCE Version 10SP6 as the drafting and design software, respectively.

Design Builder shall use ITS devices that are compatible with the data requirements of the Caltrans District 11 Transportation Management Center (TMC) back-office systems and associated communication network. 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 perform all laboratory testing at a Caltrans certified and approved lab and an AMRL-accredited facility for material tests required by this section. All material testers are to be certified for the materials they are testing.

17.2.7 Coordination with Other Agencies and Disciplines

The Department will assist in the coordination and resolution of all ITS issues with affected interests and regulatory agencies. The Design Builder shall document the resolutions of issues for the correspondence file, including meeting minutes and memoranda for the record. The Design Builder shall document the permit requirements and contacts with the permitting agencies. If required, Design-Builder shall apply for permits and pay associated costs.

17.2.8 Department Responsibilities

The Department responsibilities are as follows:

- Recommending Approval or disapproval of components and/or methods;
- Reviewing the documentation and certification of test device calibration (to ANSI specified guidelines which call for an annual calibration of test equipment) used to measure the following:
    - Electrical characteristics of power and signal control cables 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:
    - Plans
    - Specifications
    - Shop drawings
    - Measured and recorded values
- And be present when the following ITS component locations are staked or flagged:
    - F/O cable
    - Splice vaults
    - Pull boxes

- Ramp Meters
- Cabinets
- Vehicle Detection Stations

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 and or augmented 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:

- Maintenance vehicle pullout site
- Preliminary plan for maintaining existing ITS system elements such as RM and VDS during construction
- Fiber-optic cable/conduit location
- Splice vault /Pull box locations
- Cabinet locations
- Fiber-optic cable splicing and testing
- Locating ITS elements (ramp metering systems, vehicle detection stations/count stations,) and Maintenance Vehicle Pullouts (MVPs)
- Salvaged items
- Worker certifications
- Component testing (wire tests, loop detector 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
- Address and discuss ITS communication and networking issues
- Address and discuss ITS back-office system(s) issues
- Placement of changeable message signs

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, operations data collection (loop detection), and motorist information features Eight (8) high density polyethylene (HDPE) conduits, 1” or 1 1/4 “ each and suitable for the purposes of containing fiber optic cable, shall be installed underneath the NB freeway

shoulder from the South end of the Carroll Canyon Road Bridge and Overhead (Bridge No. 57-787 Rt.) to the North end of the project limits. The HDPE conduits will terminate at the North end in an existing fiber optic vault located at approximately. Sta. 453+96 "A". Fiber optic cable matching the cable located in this vault shall be installed from this existing vault to a vault to be installed at Sta. 446+60 "A". From this latter vault to the vault located at the South end of the Carroll Canyon OH, the HDPE conduits will be installed empty. Vaults will be required at both ends of structures and wherever necessary for the convenience of installing fiber optic cabling. The vault located at Sta. 446+60 "A" shall be provided with a splice closure and used to connect to fiber optic cable placed from adjacent project (EA:2T0404). The new fiber optic cable shall be spliced to the existing cable in a manner that provides consistent communication between all field elements and the communication hub building. 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.
- At a minimum, a Maintenance Vehicle Pullout (MVP) per *Caltrans Standard Plans* shall be constructed adjacent to each site of ITS components such as the controller cabinets for, and Vehicle Detection Stations and Count Stations. Wherever possible, a MVP should be installed.

The Design Builder shall use stainless steel mounting hardware (e.g., bolts, nuts, washers, and external hinges) on vaults, cabinets, shelters, and other outdoor ITS devices. The Design Builder shall use only components designed for 20 or more years of industrial use. All material, equipment, and component parts furnished shall be new (within 12 months from date of manufacture), of the latest design and manufacture, in an operable condition at the time of delivery and installation, and compatible with the in-place system.

17.3.2.1 Transportation Management Center (TMC)

The District 11 TMC's primary purpose is to integrate Department District Maintenance Dispatch and Department Division of Operations with the California Highway Patrol Dispatch into a unified command center. The integration provides the communications and computer infrastructure necessary for coordinated transportation management on freeways during normal commuting periods, as well as during special events and major incidents. The District 11 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, vehicle detection stations/count stations, changeable message signs, and highway advisory radio.

The data signals received at the District 11TMC shall be configured to be integrated with the existing RMIS/AVDS system processing hardware and software to enable operators to communicate with any CCTV

camera, changeable message sign, vehicle detection station, count stations, or ramp metering on the corridor and without affecting the existing system.

17.3.2.2 Communication Hub Buildings

The existing communication hub building is located at the termination of the SB off ramp from I-5 to Roselle Street. The existing fiber optic cable runs between this hub building and the vault located at Sta. 453+96 "A". No additional work at this hub building should be required.

17.3.3 Permanent Traffic Control

17.3.3.1 Ramp Metering Systems (RMS)

Refer to Section 23 entitled "Ramp Metering" for requirements.

17.3.3.2 Vehicle Detection Stations and Count Stations (VDSVDS and CS)

The Design Builder shall relocate and modify vehicle detection stations/count stations for measuring, at a minimum, vehicular volume and lane occupancy on the freeway. The Design Builder shall place permanent loop detection 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. The Design Builder shall furnish and install necessary equipment for all VDS/CS's to make the system fully operational.

17.3.4 [NOT USED]

17.3.5 [NOT USED]

17.3.6 Communication Network

The Design Builder shall utilize the existing ethernet network with the final products installed. The Design Builder shall modify a communication network that has redundant routing capabilities and enough bandwidth to meet the operational requirements. Fiber optic communication system shall be used in this project. The Design Builder shall perform the following:

- Perpetuate the existing communications functionality during the construction period at a specified level of service.
- Design and construct a fiber optic communications network to serve the ITS elements along the entire corridor beginning at a new fiber optic vault from approximately Sta 1440+00 to an existing fiber optic vault located at approximately Sta 1490+00Provide F/O Communication Network cables as described in Section 17.3.2.
- Propose solutions to achieve design objectives based on the functional, technical, operational, and maintenance requirements

The Design Builder shall not substitute or apply any part or attach any piece of equipment contrary to the manufacturer's recommendations and standard practices.

17.3.6.1 Fiber-Optic Cable

The Design Builder shall link the controllers of the vehicle detection stations/count stations, changeable message signs, and ramp metering systems to the communication network. The Design Builder shall provide the necessary fiber optic pigtails to controller cabinets and shall terminate the fiber optic pigtails at the fiber distribution units. The Design Builder is required to upgrade the existing hub communications end equipment as specified in this technical provision. Fiber-optic cable for devices outside the Project limits routed through the Project limits shall be rerouted. The Design Builder shall minimize the number of transverse crossings of the freeway. The Design Builder shall place the armored fiber-optic trunk cable in conduit. The Design Builder shall provide armored fiber-optic pigtails between splice vaults/shelters and field device control cabinets.

17.3.6.2 Fiber-Optic Connection Components

Indoor Patch Cords

For indoor patch cords, the Design Builder shall meet the following requirements for single-mode fibers: Indoor patch cords shall not be armored. Single mode patch cord jackets shall be yellow, 3 mm (0.12 inches) outside diameter, have agamid strength members, and yellow boots. Patch cord fibers shall have a secondary buffer from 250 μm to 900 μm. Patch cords shall be individually constructed. Patch cords shall not have factory fusion fiber splices. Patch cords shall have ST connectors. Boots shall be glued to the patch cord jacket.

Splice Panel Components

The Design Builder shall provide splice panels as needed. The splice panels shall meet the following requirements:

• Offer a combination of splicing protections and associated pigtail/fiber storage
• Compatible with a splice wheel or splice deck
• Available in 12, 48 and 72 splice capacities
• Front loaded
• Designed for a 19-inch EIA rack with brackets available to accommodate a 23-inch rack
• Hinged on one side allowing access to both the front and back of the front plate and the interior of the panel
• Provide for 5-inch recess rack mounting
• Provide for easy roll-up of pigtail and buffer tube lengths with bend radius control on the splice wheel

Patch Panel Components

The Design Builder shall provide patch panels as needed. The patch panels shall meet the following requirements:

• Allow for single fiber maintenance access
• Constructed of high-strength aluminum
• Equipped with metal doors with Plexiglas windows
• Available in 12, 24, 48, 96 and 144 termination capacities
• Front loaded
• Designed for a 19-inch EIA rack with brackets available to accommodate a 23-inch rack
• Hinged on the left front side allowing access to both the front and back of the front plate and the interior of the panel
• Provide for pigtail storage
• Provide for 5-inch recess rack mounting
• Equipped with designation labels

17.3.7 Splice Vault and Communication Pull Box

17.3.7.1 Splice Vault

The Design Builder shall furnish and install the splice vault. Splice vault shall be installed on one end of a structure and a communication pull box on the other end, and adjacent to ITS element cabinet. The splice vault and cover may be constructed of reinforced Portland cement concrete or of non-PCC material. The vault and cover shall have the following physical characteristics:

- Dimension of 60 inches long by 30 inches wide by 30 inches deep.
- Cover markings shall be labeled "CALTRANS COMMUNICATION" on each cover section.
- Cover shall support a minimum force of 100 lb-force.

17.3.7.2 Communication Pull Box

The Design Builder shall furnish and install the communication pull box. Communication pull box shall be installed every 750 to 1000 feet. The communication pull box shall be a pre-cast polymer concrete structure reinforced with fiberglass. The pre-cast polymer structure shall have the following properties:

- Modulus of elasticity of greater than 1 x 10 E6 psi.
- Compressive strength of greater than 9000 psi.
- Flexural strength of greater than 3000 psi.
- Impact Energy of greater than 30 ft-lb, and Tensile strength of at least 800 psi.

The communication pull box shall have the following physical characteristics:

- Outside dimensions of 42 inches long by 26 inches wide by 42 inches deep (42.625”x 26”x 42”),
- An open bottom.
- An approximate weight of 212 lbs.
- UL listed, Tier 10 rated, Underground Enclosure.

The steel cover shall have “CALTRANS COMMUNICATION” marking and have the following features:

- Outside dimensions of 35.625 inches x 24 inches x 3 inches,
- Weighs 85 lbs,
- Two 0.375-16 UNC stainless steel hex head bolts with washers.
- Two 0.5 inch by 4 inch pull slots.
- A skid resistant surface.

17.3.7.2 Splice Closures

The Design Builder shall enclose F/O field splices in splice closures with splice organizer trays, brackets, clips, cable ties, seals and sealant. Splice closures shall be suitable for direct burial or pull box applications. Provide manufacturers installation instructions prior to installation of splice closures. Splice closures shall conform to the following specifications:

- Non-filled thermoplastic case
- Rodent proof, water proof, re-enterable and moisture proof
- Expandable from 2 cables per end to 8 cables per end by using adapter plates
- Cable entry ports shall accommodate 10-mm to 25-mm diameter cables
- Multiple grounding straps
- Accommodate up to 8 splice trays
- Suitable for "butt" or "through" cable entry configurations
- Place no stress on finished splices within splice trays

The Design Builder shall bolt splice closures to side walls of splice vaults. The Design Builder shall verify the quality of splices prior to sealing splice closures. Perform link testing and obtain approval before sealing splice closures.

17.3.7.3 Splice Trays

Splice trays shall accommodate a minimum of 12 fusion splices and allow a minimum bend radius of 45 mm. The Design Builder shall loop individual fibers one full turn within splice trays to allow for future splicing. Fibers shall be unstressed when located in final position. The Design Builder shall secure buffer tubes near entrances of splice trays. Splice tray covers may be transparent. Splice trays shall conform to the following:

- Accommodate up to 24 fusion splices
- Place no stress on completed splices within the tray
- Stackable with a snap-on hinge cover

- Buffer tubes securable with channel straps
- Accommodate a fusion splice with the addition of an alternative splice holder
- Be labeled after splicing is completed.

Only one splice tray may be secured by a bolt through the center of the tray in fiber termination units. Secure multiple trays per the manufacturer's recommendation.

17.3.7.4 Splice Protection

The Design Builder shall mount all splices on the splice tray. Polyethylene tubes protect the fibers and ethylene vinyl acetate sleeves with stainless steel rods protecting the splices. Vinyl markers shall identify each fiber in the enclosure.

17.3.8 Grounding

17.3.8.1 Conduit, Innerduct and Communication Conduit

The Design Builder shall furnish and install communication (non-metallic) conduit for communication trunk cables and rigid steel conduits for others, which shall be UL listed. The Design Builder shall ensure the conduit and conduit splices sustain a pressure of 150 psi. The Design Builder shall furnish and install conduit systems for power and communication systems that comply with the NEC and the local standards. The Design Builder shall not use buried rigid steel conduit (RSC) except for under rail crossings as negotiated with railroad companies and under or within bridges.

Communication (non-metallic) conduit shall be PVC Schedule 40, with the exception of conduit under roadway surfaces. Conduit under roadway surfaces shall be heavy-wall rigid PVC Schedule 80.

Inner ducts shall be installed to provide protection for fiber optic cables. Separate inner ducts must be installed for each fiber optic cable along communication mainlines as shown on the plans. Inner ducts shall be one inch, smooth or ribbed high-density polyethylene (HDPE) duct. The Design Builder shall locate communication conduit such that the conduit is a minimum of 10’ off the right-of-way line where attainable.

The Design Builder shall not place the communication conduit in the bottom of a ditch or near culvert clean-out areas. The Design Builder shall place communication conduit at the middle of right shoulder and lay to a depth of not less than 24 inches below grade in asphalt concrete and Portland cement concrete areas, and not less than 30 inches below finished grade in soil area. The Design Builder shall place a bed of fine soil or sand with a minimum thickness of 2 inches in the trench before placing communication conduit. The Design Builder shall place a conduit spacer with a minimum thickness of 2 inches between the top of fine soil or sand bed and the bottom of the communication conduit, and between the communication conduits at 5 feet maximum spacing. Clearance between the side of communication conduit and the side of communication conduit trench shall be at least 2 inches.

For communication conduit trenches in asphalt concrete and Portland cement concrete areas, the Design Builder shall place a plastic sheet with minimum thickness of 0.02 inch and full trench width for the entire trench length and at 1 inch above the top communication conduit. For communication conduit trenches in soil area, the Design Builder shall place a 4 inch wide underground warning tape of “CAUTION BURIED FIBER OPTIC CABLE BELOW – CALL CALTRANS (619) 481-8147” 6 inches below finished grade and at the center of the trench. The Design Builder shall place the colored slurry cement backfill in the trench to 1.2 inch and 4 inches minimum below finished grade for trenches in the existing asphalt and Portland cement concrete pavement area, respectively. For trenches in new or existing soil area, colored slurry cement in the trench shall be filled to 1-inch minimum above the top of communication conduit. Top portion above the colored slurry cement in new or existing soil area shall be filled with structure backfill material in conformance with Section 86-2 of Caltrans Standard Specifications. For trenches in new asphalt or Portland cement concrete pavement areas, colored slurry cement shall be filled to the bottom of new lean concrete

base. For more information, refer to specifications described in the on Communication Conduit Trench Details plans included in the Preliminary Engineering Documents

17.3.8.2 Electrical Service

Unless otherwise specified, the Design Builder shall provide 120v/240v or 240/480V 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.

17.3.8.3 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 interupted. 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 (loops, RMS, CMS, 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 hardware, cabinets, and equipment. The Design Builder shall provide *x*, *y*, *z* coordinates on the installed ITS elements and on existing elements where the new elements connect to them:

- Loop detectors
- Pull boxes
- Control cabinets
- Trunk Fiber-Optic cable
- Fiber-Optic pigtails
- Splice vaults/Communication pull boxes

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. 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 48 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 Ramp Metering System

RMS shall be relocated and modified at new locations and shall comply with *Caltrans Highway Design Manual and Ramp Metering Design Guide*.

17.4.3 [NOT USED]

17.4.3.1 [NOT USED]

17.4.3.2 Loop Detectors for RMS and VDS/CS

Exact locations for all loop stations shall be determined in the final design phase of the Project. When installing queue detection loops, the Design Builder shall evaluate the site conditions.

Testing and Setting Up the Loop Detector Installation The Design Builder shall set up the loop detector card. The Design Builder shall be responsible for notifying when the loop and lead-in wire are ready for termination and testing.

Terminating Lead-in Wires in the Cabinet Detector loop lead-in cables shall be terminated on the compression terminal block in the control cabinet. The Design Builder will terminate the loop lead-in cable.

17.4.4 Communication Network

The Design Builder shall furnish and install materials and equipment such that ITS communications components are composed of identical sub-components. Identical sub-components shall be defined as components of the same manufacturer, model, and installation configuration. The ITS communications sub-components include the following:

- Fiber-optic cable
- Splice vaults, pull boxes, splice closures, and fiber-optic connection components

All locations containing identical equipment shall be configured and wired in a consistent if not identical manner by the Design Builder, including internal wiring and harnesses, wiring color codes, labeling terminal block positions, termination strips, power service configuration, and panel and equipment mounting and locations.

17.4.4.1 Proposed and Existing Fiber Optic Cable

For fiber optic trunk cable installations the Design Builder shall perform the following:

- Exercise caution and excavate by hand or by utilizing a vacuum excavator when exposing an existing F/O cable.

- Repair all nicks or abrasions on the jacket of any F/O cable. The Design Builder shall report all nicks or abrasions prior to making repairs.
- The F/O cable bending radius shall not be exceeded while handling and/or rerouting the F/O cable.

17.4.4.2 Damaged Fiber Optic Cable

For damaged fiber optic trunk cable the Design Builder shall perform the following:

- Repair active F/O cable that is severed or otherwise rendered not useable by Project activities. A liquidated damage of $1,000 per hour shall be assessed until the repair is complete or an approved temporary splice is installed. The assessment shall begin when the Design Builder severs the cable or otherwise renders the F/O cable unusable. A part of an hour shall count as a full hour. The Design Builder shall provide notification as soon as the cable damage is discovered.
- Stock approved splice kits to repair any cable damaged by construction activities

Spliced repairs to damaged F/O cable shall comply with the following:

- Initial emergency repairs to F/O cable shall utilize mechanical splices unless all fibers (severed and not severed) are fusion spliced within 24 hours.
- Splices shall be located within existing splice vaults.
- Splices shall comply with the requirements for F/O cable splicing.

Install new cable between existing terminations or vaults, as appropriate, for cable severed by the Design Builder's activities. Nicks or abrasions caused by exposing any cable by hand digging or vacuum excavation shall be sealed with rubber splicing tape. The Design Builder shall seal nicks that penetrate through the cable jacket to the armor with a cast epoxy kit. The Design Builder shall use "industry accepted lubricants" referenced in *Caltrans Standard Specification* during cable pulling operations. The lubricants shall be compatible with cable insulation materials and shall not deteriorate the cable insulation.

17.4.4.3 Armored Fiber-Optic Pigtails

The Design Builder shall use armored fiber-optic pigtails (twelve single mode) designed for outdoor use. The physical design for the cable assembly and the fiber specifications apply to the construction of armored fiber-optic pigtails: The following requirements apply to the installation of armored fiber-optic pigtails:

- The Design Builder shall remove the following lengths of outer jacket and armor from behind the breakout to allow for attaching the sheath grounding unit lead to the cable as close as possible to the cabinet ground buss.
- The Design Builder shall remove 6 inches of the outer jacket of cable terminating in the local control cabinet for CCTV.
- The Design Builder shall remove 8 feet of the outer jacket of cable terminating in a 334 series cabinet.
- The Design Builder shall remove 13 feet of the outer jacket of cable terminating in a shelter cabinet.
- The Design Builder shall bond a sheath grounding unit lead to the armor of the cable ([3.28 feet] in length) and terminate at the ground buss.
- The Design Builder shall label the cable near its cabinet entry point using white tape with cable name and meter marker.

The Design Builder shall use caution when handling the breakout portion of the armored pigtail since fiber splices under the breakout are vulnerable to damage from pressure. Within control cabinets inside the patch panel, the Design Builder shall provide strain relief on the inner jacket of the pigtail, not on the breakout. The Design Builder shall coil 60 feet of the armored pigtail in the splice vault. Factory terminated indoor pigtail breakouts shall be described as follows:

- Secondary buffer from 250 μm to 900 μm.

- One end shall be terminated with ST connectors for single mode.
- The individual 0.118-inch outer jacket shall be labeled with the fiber number (place the fiber number label within 3 inches of the connector).
- The breakouts shall be 4 feet in length.

The Design Builder shall use Approved fiber optic pigtail assemblies required by this Section 17.

17.4.4.4 Fiber-Optic Cable Installation

The cable installation shall conform to Caltrans Standard Specifications and this Technical Provision. The Design Builder shall calculate the expected tension on fiber-optic trunk cable and pulling strap prior to installing trunk cable in conduit runs. The Design Builder shall distribute the pulling force between the inner strength member and the agamid fibers by securing both to the main pulling device. The Design Builder shall use a "break-away" type pulling attachment to protect against over stressing cable. The Design Builder shall not use a cable grip that pulls only on the outer jacket to pull fiber-optic cable. The Design Builder shall backfill open trench installations of trunk cable and armored pigtails with granular material 6 inches over the cable elevation. Damage to the cable from any source or exceeding the manufacturer's recommended tensile strength limits or cable-bending radius is cause for the cables to be rejected. The Design Builder shall ensure a minimum loaded bend radius of 10 inches and minimum installed bend radius of 8 inches. The Design Builder shall not use the hand hole as a fiber pull box.

Air-Assisted Fiber-Optic Cable Installation

The Design Builder shall use air-assisted cable installation methods for all trunk fiber cables installed. Fiber shall be blown from vault to vault or vault to shelter. The Design Builder shall ensure that the duct system is properly installed with pressure-tight splices by performing the following:

- Sealing one end of the duct and pressurize the duct using a sealed blowing machine
- Maintaining a 130 psi pressure without a significant loss
- Using care around pressurized ducts

For high-speed air blowing, the Design Builder shall end-cap the front end of the cable so that it does not hang up in the duct. The Design Builder shall use proper air seals to fit the outer diameter of the cable being pushed. The Design Builder shall clean, dry, and prove that the duct is not crushed and properly spliced. The Design Builder shall prove this by performing the following:

- Blow a hard tight mandrel through the duct to establish the duct is not crushed.
- Blow a tight fitting foam carrier through the duct at a high pressure. The foam shall travel at 100 ft/s.
- If excess water or dirt comes from the duct, repeat the process until minimal water and dirt is extruded.
- Dry the duct with airflow.

For high-speed air machines (no missile), the Design Builder shall inject the recommended amount of Approved lubricant and spread it with a foam carrier. For piston-type machines, the Design Builder shall inject the majority of the lubricant in front of the missile with some placed behind the missile. The Design Builder shall hook the blowing machine to the duct. For push/pull machines, the Design Builder shall attach the piston to the cable and insert the piston into the duct. For high-speed blowing machines, the Design Builder shall hand push approximately 100 feet of cable into the duct prior to activating the machine.

17.4.4.5 Fiber-Optic Cable Splicing

The Design Builder shall splice fiber-optic cable as part of the fiber-optic pigtail termination. The Design Builder shall only fusion-splice the fiber-optic cable. Cable splices will only be allowed with the approval of the Department and only at the location specified and then only when there are no practical alternatives. Splices shall be made only in cabinets and splice vaults using Approved splice closures. The Design Builder

shall strictly follow the fiber-optic cable manufacturer's methods, recommendations, materials, and techniques for splicing. The Design Builder's splicing equipment shall be in good working order, properly calibrated, and meet all industry standards and safety regulations. The cable preparation, closure installation, and splicing shall be accomplished in accordance with industry standards. To minimize mechanical stress and splicing locations, cables shall be trained into final position observing minimum bending radii of the cable of not less than 20 times the diameter of the cable or as per the manufacturer's requirements, whichever is greater. Cleanliness and freedom from contamination shall be strictly observed with respect to splicing materials and joint construction. Upon completion of the splicing operation, the Design Builder shall deposit all waste material in suitable containers, remove from the job site, and dispose.

17.4.4.6 Fiber-Optic Connection Components

Fiber-optic connection components may be necessary to connect Project-installed cable to the ITS communications network. The Design Builder shall follow the requirements of the necessary components in the following sections.

Indoor Patch Cords

See Design Requirement section of this technical provision.

Indoor Pigtails

Indoor pigtails (twelve single modes) shall be required for field splicing, for connecting armored pigtails, and for connecting to patch panels for fiber splicing and testing at trunk cable termination points.

ST Fiber Connectors

The ST connector complies with the requirements for single mode fiber connector for this project.

17.4.4.7 Fiber-Optic Cable Identification Requirements

The Design Builder shall identify all fiber-optic cable whenever the cable is entering or leaving a vault, housing, or enclosure and at all terminals. The Design Builder shall use permanent non-conducting marking tags fastened securely to the cables for identification. The Design Builder shall use cable designations that consistently conform to the Accepted overall scheme developed to indicate location, circuit, device, cable number, terminal branch, position, etc. Letters and numbers shall be used by the Design Builder. See sample NSSP in Reference Documents. The outer jackets shall have the surface printed with manufacturer's identification, date of manufacture, and manufacturer's part number.

17.4.4.8 Coaxial Cable

The Design Builder shall not use coaxial cable, other than when the Design Builder determines it is necessary and approves.

17.4.5 Traveler Information

17.4.5.1 Changeable Message Signs

The Design Builder shall relocate the existing changeable message signs when they are necessary. The Design Builder shall be responsible to determine the new locations for the relocated changeable message signs and design to make the systems functional and operational.

17.4.6. Splice Vault and Communication Pull Box

17.4.6.1 Splice Vault

The Design Builder shall place the splice vaults in locations to minimize the number and length of pigtails. However, the location of field devices shall be the controlling factor in vault placement. The Design Builder shall include in the construction of a splice vault a drainage system, grounding provisions, enclosure hanger bracket assembly, and a ground rod marker. The splice vault protects the outdoor fiber splice enclosure and

shall meet the following requirements: The vault material shall meet the UL requirements for Tier 10 heavy-duty splice vault. The fiber-optic cables shall sweep up near the vault to meet the conduit entrance to the vault (take care not to exceed minimum bend radius). Clean splice vaults after installation and splicing of cables. Cables shall be coiled onto the F/O hanger brackets within the vault. The Design Builder shall provide a drainage system for the Splice Vault. The Design Builder shall furnish and install a sheath grounding unit between the splice enclosure and the ground rod. The Design Builder shall clean existing vaults prior to installing cable.

17.4.6.2 Communication Pull Box

The Design Builder shall place the communication pull box near the approach panels off each end of the bridge to provide an access point to Traffic Management System conduits placed within the bridge rail. Fiber Optic cable shall have two coil loops within the vault for expansion/contraction purposes. The Design Builder shall provide a drainage system in the communication pull box to avoid water infiltration into the conduit within the bridge rail.

17.4.6.3 Outdoor Fiber Splice Closure

The Design Builder shall install sufficient desiccant (packaged silica) in the closure to reduce possible damage from moisture. The Design Builder shall bond all fiber-optic cable shields in fiber-optic splice vaults to the ground lug of the outdoor fiber splice closure. The Design Builder shall bond a sheath grounding unit conductor to the ground lug of the splice closure and the other conductor to the outside ground rod. The Design Builder shall mount the sheath grounding unit to the inner wall of the vault along the upper half. The Design Builder shall use a ground strap to connect the two grounding posts to electrically tie them together. Non-oxidizing coating shall be applied to all connections. The Design Builder shall tape the F/O Cables together as necessary near the Outdoor F/O Splice closure and throughout the slack length.

17.4.6.3.1 Mounting Splice Enclosure in Vault

The Design Builder shall mount the furnished and installed outdoor fiber splice enclosure in the splice vault. Mounting of the outdoor fiber splice enclosure shall require a bracket to be constructed to fit the opening to the splice vault. The bracket shall be constructed so that the bracket and enclosure cannot fall into the vault. The bracket shall remain long enough to rest on the vault lid ledge. The objective of this bracket shall be to keep the splice enclosure off the floor of the vault. The Design Builder shall construct the bracket as follows:

- The main support member shall be placed 1/8 inch under the vault opening and is 1 inch by 1.5 inches variable-length "C" channel and may be perforated with web-centered holes. The length dimension will vary with the diameter of the access cover.
- The ends of the main support member shall have "Z" brackets constructed of 0.1875-inch steel 1.5 inches wide. The "Z" brackets rest on the vault lip for the round access cover.
- The outdoor fiber splice enclosure shall be hung from the bracket assembly with 0.125-inch stainless-steel cable.

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
- Be code compliant.

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 VDS Shelters, CCTV poles and CMS structures with lightning braid.
- Irreversible compression is used when grounding VDS Shelters, CCTV poles and CMS structures with lightning braid. The irreversible compression bond is achieved by:
    - Using a hydraulic press with a connector die.
    - Using a solid copper connector with a run for a 5/8 inch ground rod and a tap for the specified ground conductor.
    - Using connectors that can accommodate a conductor range from No. 6 solid copper through 500 Kcmil, are pre-filled with an antioxidant compound, and are strip sealed.

The Design Builder may propose other methods and materials for implementing an irreversible compression bond and submit the associated products and procedures of equal quality for Approval.

17.4.8 Conduit, Innerduct and Communication Conduit

The Design Builder shall not direct-bury fiber-optic cable on this Project. The Design Builder shall install armored fiber-optic cables (fiber optic outside plant cable) with inner ducts together in conduit for the entire length of the corridor. The Design Builder shall use high-density polyethylene NMC. The Design Builder shall immediately cap all open ends of installed conduit until cables are installed. "Abandon conduit" shall mean the Design Builder removes the abandoned cables. Standard bell ends shall be installed on all conduit ends by the Design Builder to prevent damage to the installed cable.

The Design Builder shall install a 3.15-inch wide, stretchable, orange warning tape between 18 inches and 12 inches below the surface over all conduit bearing communications cables. The tape shall bear the permanent legend "CAUTION: BURIED FIBER OPTIC CABLE- The Design Builder shall install NMC used for fiber-optic cable a minimum of 24 inches below the finished grade of paved shoulder and encased with color slurry cement as specified in the Caltrans Standard Specifications.

17.4.8.1 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. The Design Builder shall submit the Fiber-Optic System Test Plan for Approval.

17.5.1.1 Over-the-Shoulder Design Documents

During the design process, any submittals required in the Design Standards or other Contract Documents shall be prepared by the Design Builder and submitted to the Department. Submittals shall be in a format acceptable and organized to facilitate review. It shall be the responsibility of the Design Builder to coordinate to insure that the structure of the submittals is satisfied.

17.5.1.2 Released for Construction (RFC) Documents

The Design Builder shall produce plans and specifications in a format that aids and facilitates design review and provide adequate information for safe, efficient, and high-quality construction. Plan sets and sheet types shall be developed in accordance with the *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 assembly, loop lead-in, loop conductor, and the splice encapsulator. Acceptance of each submittal is required before the installation of the ITS element will be authorized. The Design Builder shall submit the loop detector test report within one week after completing installation for loops. The Design Builder shall submit all wiring diagrams for review and incorporate comments resolved in the wiring diagram. The Design Builder shall submit power and control cable test results within 7 days of making final connections.

17.5.1.3.1 Fiber-Optic Cable Test Documentation

The Design Builder shall submit fiber-optic cable test documentation including calibration and certification of the fiber-optic cable test equipment as part of the component documentation. The Design Builder shall follow the format of the Fiber-Optic System Test Plan. The Design Builder shall use the Department file naming convention for all OTDR test files. The Design Builder shall provide all test documentation on a CD. The Design Builder shall store OTDR files under a directory named by the highway number. These files shall include the following: actual date of testing, all splice points marked, the "index of refraction" (recorded on the cable spool by the manufacturer), and file names and notes as described by the Department file naming convention. The Design Builder shall provide OTDR "make and model" information as part of the Project Documentation Submittal. The Design Builder shall provide a test summary describing the following:

- Final measurements that were out of range.
- Approved changes in specified methods.
- Dates tests were performed by both Power Meter and OTDR.
- Other special circumstances.

The Design Builder shall provide the Department System Integrator additional two copies of the manufacturer's reel (spool) test documentation. The test documentation is shipped with the fiber-optic cable spool.

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)

The Department has provided ITS Non-Standard Special Provisions (NSSPs) examples in the Reference Information Documents for the design and construction of the ITS. These ITS NSSPs had been approved by HQ Traffic Operations on other projects and may be used on this project, but will need to be re-submitted for approval. If the ITS NSSPs examples provided in the Reference Information Documents are not utilized by the Design-Builder for design and construction of the ITS system, the Design-Builder must develop new specifications and submit them for review and approval 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 at the IPO .

17.5.2.2 As-Built Documents

Upon completion of the Project and before Final Acceptance, the Design Builder shall deliver a complete set of as-built documents and design files that incorporate all design changes and details of Accepted Work that occurred throughout the Project. As-Built Documents must be submitted in both hardcopy and electronic form. The As-Built Documents shall meet the format and content requirements of Final Design Documents. The Design Builder shall sign, seal and date the title sheet of the As-Built Documents to certify that the Work was completed in accordance with the plans, the Contract Documents, the Governmental Approvals and applicable Law.

18 Maintenance of Traffic

18.1 General

The Design-Builder shall perform all Work necessary to meet the requirements associated with Maintenance of Traffic (MOT) in accordance with the requirements of the Contract Documents and these Technical Provisions. This work includes, but is not limited to, providing for the safe and efficient movement of people, goods, and services around the Project while minimizing impacts to residents, commuters, and businesses.

18.2 Administrative Requirements

18.2.1 Standards

The Design Builder shall perform the Work in accordance with the requirements of the standards listed by priority below.

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

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

Use the most current version of each listed standard as of the Request For Proposals (RFP) issue date l unless otherwise specified herein or 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 (CA MUTCD)
4	Department	Standard Special Provisions
5	Department	Standard Plans 2006
6	Department	Amendments to the 2006 Standard Specifications
7	Department	Design-Build Modifications to the Standard Specifications
8	Department	May 2006 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, 3rd Edition
15	Department	Ramp Meter Design Manual

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
Department	Temporary Pedestrian Facilities Handbook April 2011
TRB	Highway Capacity Manual

18.2.3 Traffic Management Plan

The Design-Builder shall develop, implement, and maintain a Traffic Management Plan (TMP) that includes the following items:

- Descriptions of the duties of the Traffic Engineering Manager, Traffic Control Supervisor and other personnel with MOT responsibilities.
- A Traffic Management Plan Data Sheet (Checklist) completed under the direction of the Traffic Engineering Manager. See Exhibit 18A..
- Procedures to identify and incorporate the needs of emergency service providers, law enforcement entities, local governments and agencies, and other related corridor users.
- Procedures to address special circumstances such as equipment malfunctions, traffic incidents, and special events.
- Procedures to modify the TMP as needed to adapt to current Project circumstances.
- Procedures to communicate TMP information to the Design-Builder's public information personnel, the Department Public Information Office, and notify the public of Maintenance of Traffic issues in conjunction with the requirements of Book 2, Section 3.

18.2.4 MOT Task Force

18.2.4.1 Membership

The Design-Builder shall establish a MOT task force, inviting representatives of the Design-Builder, Department, Cities, , law enforcement agencies, emergency response providers, Utility Owners, Railroad, 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 5 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 comply with the Lane Closure Charts provided by the Department (Exhibit 18-B). Any revisions to the Lane Closure Charts provided, or additional Lane Closures Charts required for the Work, shall be requested by the Design-Builder. The Department will have 15 Working Days to review the request. If approved the Department will provide revised or additional Lane Closure Charts. Compliance with Lane Closure Charts shall not constitute a Change in the Work, and therefore not eligible for Change Order in accordance with Section 13.11 of Book 1.

The Design-Builder shall comply with the detour routes for on-ramp and connector closures provided by the Department (Exhibit 18 B) in the Lane Closure Charts in the development of final Detour Plans. Any revisions to the detour routes provided, or additional detours required, shall be submitted to the Department for approval. The Department will have 15 Working Days to review the request. It is the Design-Builder's responsibility to contact and obtain approval from local agencies for detours on roads or streets under their jurisdiction.

The Design-Builder shall provide Sign Details plans showing how to fabricate any sign not detailed in the CA MUTCD. This includes sign dimensions, message, lettering sizes, and colors.

18.3.2 Haul Roads

The Design-Builder must have its haul roads pre-approved by the Department and 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 Department and appropriate governing agency.

18.3.3 Pedestrian Access and Trails

The Design-Builder shall maintain pedestrian access on all sidewalks, trails, and intersections along all streets as much as possible. If access cannot be maintained, the Design-Builder shall obtain approval from the Department and the appropriate governing agency to provide temporary pedestrian access and shall furnish and install proper signing, and lighting for pedestrians in accordance with Caltrans Temporary Pedestrian Facilities Handbook (Exhibit 18 C).

The Department and other appropriate governing agencies shall be notified 10 Working Days prior to the closure, and advanced signing shall be provided notifying all users of the detour plan. . This signing shall be erected a minimum of seven (7) Days prior to the closure and shall note the closure duration.

18.3.4 [NOT USED]

18.3.5 Temporary Auxiliary Lanes and Exit Ramp Extensions

Temporary lanes and extensions for exit ramps shall be designed and constructed to meet the following requirements:

- Exiting traffic must not have to slow down in the through lanes to less than 50 mph in order to safely gain access to the temporary auxiliary lane.

- The temporary auxiliary lane must be long enough so that traffic leaving the through lane at 50 mph can slow down safely to a speed of 30 mph.
- The temporary auxiliary lane shall have a paved surface width of at least 12 feet and paved shoulder width of at least 3 feet.
- Temporary bypass extensions shall have a paved surface width of at least 16 feet and paved shoulder width of at least 3 feet on both sides.
- The infield slope shall not be steeper than 1:4 (v:h).
- Acceleration lanes shall be designed to meet the standards shown in the *Highway Design Manual*.
- All temporary auxiliary lanes and extensions for exit ramps shall be provided with temporary overhead lighting.
- A minimum15-foot reaction distance shall be provided for any temporary or permanent barrier device, including portable temporary concrete barrier.
- The Design-Builder shall install all temporary signing and pavement markings required to safely open the road to traffic. This Work shall be completed on or before the date of opening.

18.3.6 Temporary Railing (Type K), Guardrail, Barrier, Lights, Signals, Attenuators, and Glare Screen

The Design-Builder shall be responsible for using temporary railing (Type K), guardrail or barrier and attenuators and take any other necessary protective measures to protect the traveling public from all Work by the Design builder that creates a condition that is hazardous to the public and to direct traffic. The use of Temporary traffic control devices shall conform to the following provisions and these Technical Provisions:

- Fixed objects within the 15 foot clear zone
- Slopes steeper than 1:4 (v:h)
- Section 7-1.08, "Public Convenience," of the Standard Specifications with amendments.
- Section 7-1.09, "Public Safety," of the Standard Specifications with amendments.

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 Contract Acceptance of the Project and when such traffic control devices are no longer required as determined by the Department.

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 CA 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 (Exhibit 18-B). .

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.

The maximum length of a single stationary lane closure shall be 1/3 mile.

Not more than one (1) separate stationary lane closures will be allowed in each direction of travel at one time.

Local authorities shall be notified at least five (5) business days before work begins. The Design-Builder shall cooperate with local authorities to handle traffic through the work area and shall make arrangements to keep the work area clear of parked vehicles.

Adjacent ramps, in the same direction of travel, servicing two (2) consecutive local streets shall not be closed simultaneously unless directed by the Department.

SC6-3(CA) (RAMP CLOSED) sign shall be used to inform motorists of the temporary closing of a connector, entrance ramp or exit ramp for 1 business day.

SC6-4(CA) (RAMP CLOSED) sign shall be used to inform motorists of the temporary closing of a connector, entrance ramp or exit ramp for more than 1 business day.

The SC6-3(CA) or SC6-4(CA) signs shall be installed at least 7 days before closing the connector or ramp, but not more than 15 days before the connector or ramp closure. The Design-Builder shall notify the Department at least 2 business days before installing the SC6-3(CA) or SC6-4(CA) signs.

Accurate information shall be maintained on the SC6-3(CA) or SC6-4(CA) signs. The SC6-3(CA) or SC6-4(CA) signs, when no longer required, shall be immediately covered or removed.

Personal vehicles of the Design-Builder's employees shall not be parked on the traveled way or shoulders including sections closed to public traffic.

When work vehicles or equipment are parked within 6 feet of a traffic lane to perform active construction, the shoulder area shall be closed with fluorescent orange traffic cones or portable delineators placed on a taper in advance of the parked vehicles or equipment and along the edge of the pavement at 25-foot intervals to a point not less than 25 feet past the last vehicle or piece of equipment. A minimum of 9 traffic cones or portable delineators shall be used for the taper. A W20-1 (ROAD WORK AHEAD) or W21-5b (RIGHT/LEFT SHOULDER CLOSED AHEAD) or C24(CA) (SHOULDER WORK AHEAD) sign shall be mounted on a crashworthy portable sign support with flags. The sign shall be placed where designated by the Department. The sign shall be a minimum of 48" x 48" in size. The Design-Builder shall immediately

restore to the original position and location a traffic cone or delineator that is displaced or overturned, during the progress of work.

If minor deviations from the lane requirement charts are required, a written request shall be submitted to the Department at least 15 days before the proposed date of the closure. The Department may approve the deviations at its sole discretion if the work can be expedited and better serve the public traffic.

Lane Closure Restriction for Designated Legal Holidays

Thu	Fri	Sat	Sun	Mon	Tues	Wed	Thu	Fri	Sat	Sun
x	**H** xx	xx	xx							
x	xx	**H** xx	xx							
	x	xx	**H** xx	xx						
	x	xx	xx	**H** xx	xxx					
				x	**H** xx					
					x	**H** xx				
						x	**H** xx	xx	xx	xx

Legends:	
x	The full width of the traveled way shall be open for use by public traffic after 0500.
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 0500.
H	Designated Legal Holiday

REMARKS: This table is to be used concurrently with all charts.

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.

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	Rte. 805	1st half hour 2nd half hour 2nd hour and beyond	$3800 / 10 minutes $5700 / 10 minutes $7600 / 10 minutes
Connector	NB 805 Connector to Rte. 52	1st half hour 2nd half hour 2nd hour and beyond	$1000 / 10 minutes $1000 / 10 minutes $1000 / 10 minutes
Connector	EB 52 Connector to NB 805	1st half hour 2nd half hour 2nd hour and beyond	$1000 / 10 minutes $1000 / 10 minutes $1000 / 10 minutes
Connector	WB 52 Connector to NB 805	1st half hour 2nd half hour 2nd hour and beyond	$1150 / 10 minutes $1750 / 10 minutes $2350 / 10 minutes
Connector	WB 52 Connector to SB 805	1st half hour 2nd half hour 2nd hour and beyond	$1000 / 10 minutes $1000 / 10 minutes $1000 / 10 minutes
Connector	SB 805 Connector to Rte. 52	1st half hour 2nd half hour 2nd hour and beyond	$1000 / 10 minutes $1000 / 10 minutes $1250 / 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 CA 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 ± _____ 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.

18.4.7 Pavement Markings During Construction

The Design-Builder shall inspect and replace all damaged or missing pavement markings daily.

The Design-Builder shall clean or replace all pavement markings when they become damaged or lose reflectivity.

The Design-Builder shall use equipment that is not detrimental to the roadway surface for removing pavement markings, as Approved by the Department.

The Design-Builder shall replace or clean temporary pavement markings whenever the reflectivity of the markings has deteriorated to 80% or less of the value specified for the material when new. Reflectance values shall be measured in accordance with ASTM D4061. The Design-Builder shall perform the required tests monthly at 1-mile intervals or at specific locations requested by the Department.

18.4.8 Temporary Signalization

18.4.8.1 Electrical Service

The Design-Builder shall coordinate with the local power supplier to provide the electrical service connection for each temporary signal system. The Design-Builder shall pay the monthly electrical power costs of the temporary signal system.

18.4.8.2 Material Requirements

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

The Design-Builder shall supply all required materials for the temporary signalization, except for the controller and controller cabinet. The Design-Builder shall install the signal controller cabinet for temporary signal systems. The Design-Builder shall be responsible for cabinet base construction and external wiring connections.

18.4.8.3 Department Inspection

The Design-Builder shall provide 24-hour notice to the Department prior to implementing temporary signal phasing. The Design-Builder shall provide vehicle detection methods to optimize all temporary signal system installations.

18.4.8.4 Operation and Maintenance

The Department will provide signal timing for temporary signals. The Department will enter the timing parameters into the signal controller. The Department will be responsible for the operation and maintenance of the signal controllers and signal controller cabinets for temporary signals.

The Design-Builder shall maintain all components of the temporary signal systems, except for the controllers and controller cabinets. The Design-Builder shall remove all temporary signal system installations upon completion and operation of the new permanent signal systems. The Design-Builder shall maintain all materials not maintained by the Department of the new and revised permanent signal systems from the first day of construction until Final Acceptance.

18.4.8.5 Salvage

The Design-Builder shall salvage the cabinet, controller, and any type of detector other than a loop detector, for all temporary signal system installations and deliver the salvaged items to a location determined by the Department. The salvaged items will become the property of the Department.

18.4.9 Temporary Lighting

18.4.9.1 General

The Design-Builder shall:

- Design temporary lighting plans.
- Maintain current levels of roadway illumination for all roadway segments and interchanges that are currently lit.
- Provide all materials and equipment for temporary lighting installations, using either screw-in bases and poles or wooden poles.
- In the clear zone, provide only lighting units that are breakaway or protected from crash potential.
- Provide maintenance for the temporary lighting system.

18.4.9.2 Screw-in Bases, Wooden Poles

If screw-in bases and poles are used for temporary lighting, the bases, poles, and accessories shall be salvaged after the Project construction and delivered to the Department. These salvaged items will become the property of the Department. If wooden poles are used, the Design-Builder shall remove the poles before Final Acceptance. The wooden poles shall remain the property of the Design-Builder.

18.4.9.3 Power Service Costs

The Department or others will pay all monthly electrical bills for lighting after Final Acceptance of the Project.

The Design-Builder shall coordinate with the local power supplier to provide the power service connection. The Design-Builder shall pay all costs charged by the electric power companies for providing power connections. The Design-Builder shall pay the monthly electric bills for temporary lighting installed under the Contract until Final Acceptance of the Project.

18.4.10 MOT Traffic Control Supervisor

The Design-Builder shall provide a MOT Traffic Control Supervisor (TCS) to manage and monitor all MOT operations for the duration of the construction. The TCS will be considered a critical component of the Design-Builder's management team and must have prior experience managing MOT operations on similarly complex projects. The TCS does not need to be a licensed professional engineer; however, the Design-Builder may elect to use his Traffic Engineering Manager in this position.

The TCS or his designate shall be available on a 24-hour per day basis throughout the duration of the Project, must participate in all changes in the MOT setup, and perform daily Project reviews to verify that MOT devices are correctly placed and traffic is safely and efficiently moving through the Project. The TCS or his designate shall be available on the Site within 45 minutes of notification of an emergency situation and be prepared to positively respond to the need to repair the work zone traffic control or to provide alternate traffic arrangements. The TCS shall have enough authority and resources to immediately correct any deficiencies discovered or to demobilize any construction operation that is resulting in excessive delays to traffic or creating an unsafe condition.

18.4.11 Access

At a minimum, the Design-Builder shall provide the following:

- Access for emergency vehicles and buses to all residences and businesses at all times
- Access to properties of existing property owners during construction by the end of each day
- Temporary access where needed to maintain access to properties

18.5 Deliverables

18.5.1 Traffic Management Plan (TMP)

The Traffic Management Plan must be approved prior to issuance of NTP2. The TMP shall be signed and sealed by the Traffic Engineering Manager. The Department will respond to the submittal within 5 Working Days.

18.5.2 Released For Construction Documents (RFC)

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

- Stage Construction Plans

- Traffic Handling Plans
- Detour Plans
- Specifications and Special Provisions

These RFC documents, and any subsequent revisions, shall be signed and sealed by a California licensed Civil 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	Traffic Management Plan Data Sheet
Exhibit 18-B	Lane Closure Charts
Exhibit 18-C	Temporary Pedestrian Facilities Handbook

These documents 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.

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 maintenance activities. Use the most current version of each listed standard as of the Request For Proposals (RFP) issue Date unless otherwise specified 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	Standard Plans May 2006
5	Department	May 2006 Standard Specifications
6	Department	Design Build Modification to the Standard Specifications
7	Department	California Manual on Uniform Traffic Control Devices (CAMUTCD)
8	Department	Temporary Pedestrian Facilities Handbook April 2011
9	AASHTO	Roadside Design Guide, 3rd Edition
10	AASHTO	Policy on Geometric Design of Highway and Streets

11	Department	Project Development Procedure Manual
12	Department	Technical Memoranda
13	Department	Environmental Document

19.2.2 Maintenance Management Plan

The Design-Builder shall prepare a Maintenance Management Plan that includes the following:

- A list of all proposed routine maintenance activities
- Schedule of proposed routine maintenance activities
- Name of the Design-Builder's supervisor who will be in charge of maintenance efforts

19.2.3 Meetings

The Design-Builder's supervisor responsible for maintenance during construction shall attend weekly field meetings.

19.3 [NOT USED]

19.4 Construction Requirements

19.4.1 Design-Builder's Responsibilities

The Design-Builder shall assume maintenance of the entire Project, except for those activities that will be performed by the Department, counties, and cities as specified in Section 19.4.2, commencing at 12:01 a.m. on the first Day after Contract execution. This maintenance responsibility shall continue until 11:59 p.m. on the date of Final Acceptance by the Department. In general, this maintenance will include all routine maintenance normally performed by the Department, counties, and cities on time cycles equal to, or less than, the Contract duration. Also included shall be the required maintenance and repair of all Project facilities damaged by normal wear, forces of nature, or acts of third parties. The Design-Builder shall be responsible for maintenance of the following:

1. Temporary facilities
2. Existing facilities that are to be later replaced or reconstructed as part of the Contract Work
3. Existing facilities that are to remain
4. Haul routes for Project materials
5. Project detours initiated by the Design-Builder

Maintenance on temporary or existing facilities to be replaced shall be performed to provide a safe, effective, and aesthetically pleasing transportation corridor. Effort required on existing facilities to remain shall be for the added criterion of maintaining the service life of that facility.

Responsibilities of the Design-Builder include the following:

- Repair of shoulder drop-offs
- Replacement/repair of existing asphalt shoulders if used for temporary traffic control or hauling
- Replacement/Repair of temporary roadways and crossovers
- Replacement/repair of traffic attenuators
- Maintenance of temporary delineators, temporary signing, and temporary pavement marking
- Drainage/erosion control maintenance related to construction activities

- Repair of approach slabs damaged by construction operations
- Maintenance of haul routes
- Temporary lighting and signal system maintenance
- Fence maintenance including Right of Way fencing and temporary fencing
- Weed control
- Litter control
- Graffiti removal
- Maintenance of storm sewer system related to construction activities
- Replacement/repair of temporary and permanent barrier wall
- Landscaping (areas identified as protect and maintain)

19.4.2 Department Responsibilities

The Department will be responsible for the following:

- Inspections of existing structures

19.5 Deliverables

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

The Design-Builder shall prepare and submit to the Department a monthly Maintenance Report detailing all maintenance activities performed. The report shall subdivide the reported activities as detailed in Section 19.4.1 above.

20 BICYCLE AND PEDESTRIAN FACILITIES

20.1 General

The Design-Builder shall perform all Work necessary to meet the requirements associated with bicycle and pedestrian facilities for the Project. The Design-Builder shall ensure the bicycle and pedestrian facilities of this project support the Department commitment to integrate bicycle and pedestrian travel into Project Development. Design-Builder shall also ensure that all roads on which bicyclist are not prohibited meet bicyclist and pedestrian safety and mobility needs. Damaged Bicycle and Pedestrian facilities within the Planned Right of Way limits shall be restored to current standards as of the Request For Proposals issue date.

The Design-Builder shall design and construct bicycle and pedestrian facilities 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.

20.2 Administrative Requirements

20.2.1 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 ITP issue date unless modified by Addendum or Change Order.:

20.2.1.1 Bicycle Facilities Standards and Requirements

Priority	Agency	Title
1	Department	Highway Design Manual (HDM)
2	Department	California Manual on Uniform Traffic Control Devices
3	AASHTO	Policy on Geometric Design of Highways and Streets
4	Department	Special Provisions
5	Department	2006 Revised and New Standard Plans
6	Department	Standard Plans May 2006
7	Department	Design-Build Modifications to the Standard Specifications
8	Department	Standard Specifications
9	AASHTO	Roadside Design Guide
10	Department	Technical Memoranda
11	California	Code Regulations Title 24

20.2.1.2 Pedestrian Facilities Standards and Requirements

Priority	Agency	Title
1	Department	Design Information Bulletin (DIB) 82

2	Department	Highway Design Manual (HDM)
3	Department	California Manual on Uniform Traffic Control Devices
4	AASHTO	Policy on Geometric Design of Highways and Streets
5	Department	Standard Special Provisions
6	Department	2006 Revised and New Standard Plans
7	Department	Standard Plans May 2006
8	Department	Design-Build Modifications to the Standard Specifications
9	Department	Standard Specifications
10	AASHTO	Roadside Design Guide
11	Department	Technical Memoranda
12	California	Code Regulations Title 24

*Document modified for design-build.

20.2.2 References

Use the references listed below as supplementary guidelines for the design and construction of the bicycle and pedestrian facilities. These references are not binding on the Design-Builder.

Bicycle and Pedestrian References

Agency	**Title**
FHWA	BIKESAFE Bicycle Safety Guide
AASHTO	Guide for the Planning, Design, and Operation of Pedestrian Facilities
AASHTO	Guide for Development of Bicycle Facilities
FHWA	Pedestrian Facilities Users Guide
FHWA	PEDSAFE Pedestrian Safety Guide and Countermeasure Selection System
FHWA	An Analysis of Factors Contributing to "Walking Along Roadway" Crashes; Research Study and Guidelines for Sidewalks and Walkways
FHWA	How to Develop a Pedestrian Safety Action Plan
Department	Project Development Procedures Manual (PDPM)
Department	Plans Preparation Manual
Department	CADD Users Manual
Department	Ready to List and Construction Contract Award Guide (RTL Guide)
Department	Roadway Lighting Design Manual
ANSI	Illuminating Engineering Society of North America, Roadway Lighting
ANSI	Approved AASHTO Roadway Lighting Design Guide
ANSI	Pedestrian Facilities Handbook
Department	Traffic Manual

Department	*Complete Intersections: A Guide to Reconstructing Intersections and Interchanges for Bicyclists and Pedestrians (Available at:* http://www.dot.ca.gov/hq/traffops/survey/pedestrian/)
Department	Pedestrian and Bicycle Facilities in California (available at: http://www.dot.ca.gov/hq/traffops/survey/pedestrian/TR_MAY0405.pdf)

20.2.3 Preliminary Engineering Documents

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

The Design-Builder shall have the flexibility to make Project changes without impairing the essential functions and characteristics of the Project, such as safety, traffic operations, durability, desired appearance, maintainability, environmental protection, drainage, and other permitted constraints; provided that the Design-Builder shall perform the Work in accordance with the Standards and Requirements set forth in these Technical Provisions unless the Design-Builder obtains a deviation or Exception to those Standards or Requirements in accordance with the design review process set forth in the Design-Build Contract.

20.2.4 Software Requirements

The Design-Builder may at its own discretion use any software when submitting plans for approval but shall submit final drawings in MicroStation SE and CAiCE Version 10SP6 formats

as the drafting and design software, respectively.

20.2.5 Meetings

The Department and the Design-Builder shall meet at the request of either party, as necessary, to discuss and resolve matters relating to bicycle and pedestrian Work during the design and construction stages. The requesting entity shall provide the other entities 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.

20.2.6 Coordination with Other Agencies

The Design-Builder shall comply with requirements for the design of bicycle and pedestrian facilities with other agencies having jurisdiction over such facilities, including:

- The City of San Diego

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.

20.3 Design Requirements

20.3.1 Bicycle and Pedestrian Concept Meeting

The Design-Builder shall take an inventory of all the existing bicycle and pedestrian facilities in the Project. The Design-Builder shall schedule and participate in a bicycle and pedestrian concept meeting to present a layout of the in-place and proposed bicycle and pedestrian elements on the Project to the Department. Presentation shall also address those elements of the roadway design that impact bicycle and pedestrian safety and mobility needs. The Design-Builder shall use the outcome of the meeting to finalize the bicycle and pedestrian needs of the Project.

20.3.2 Bicycle Facilities

Design-Builder's Bicycle facilities shall be consistent with the region's and local municipalities bicycle plan, comply with Environmental Approvals, and accommodate existing bicycle paths and crossings, and on-street

bicycle facilities. The Design-Builder shall restore damaged Bicycle facilities within the Planned Right of Way limits to current standards as of the RFP issue date.

20.3.2.1 Grades

The Design-Builder shall design and construct grades for Bicycle facilities that comply with requirements in the *Caltrans Highway Design Manual*.

20.3.2.2 Width and Separation on Bridges

The Design-Builder shall design and construct width and separation on bridges to comply with requirements in the *Caltrans Highway Design Manual*.

20.3.2.3 Signing and Striping

The Design-Builder shall design and construct Signing and Striping Work to conform to *Caltrans Highway Design Manual and the most recent version of the California Manual of Uniform Traffic Control Devices (CA MUTCD)* .

20.3.3 Pedestrian Facilities

Design-Builder's pedestrian facilities shall be consistent with the local agency or region's pedestrian plan, or Complete Streets component of the local General Plan, comply with Environmental Approvals, and accommodate existing pedestrian paths and crossings, and on-street pedestrian facilities. The Design-Builder shall restore damaged Pedestrian facilities within the Planned Right of Way limits to current standards as of the RFP issue date.

20.3.3.1 Grades, Width and Separation

The Design-Builder shall design and construct grades, width and separation for pedestrian facilities in accordance with the *Caltrans Highway Design Manual* and DIB 82-04.

20.3.3.2 Roadways

The Design-Builder shall design and construct pedestrian facilities to comply with requirements in the *Caltrans Highway Design Manual*.

20.3.3.3 Bridges

The Design-Builder shall design and construct width and separation on bridges for pedestrian facilities to comply with requirements in the *Caltrans Highway Design Manual*.

20.3.3.4 Exceptions to Accessibility Design Standards

If it is found that an accessibility design standard cannot be fully incorporated in a design, an exception to accessibility design standards will be required. The Design-Builder shall submit the final exception to accessibility design standards for Approval by the Department. The Design-Builder is discouraged from creating additional exceptions to accessibility design standards, since there is no assurance that they will be approved by the Department and FHWA as necessary; however, elimination of existing exceptions to accessibility design standards by the Design-Builder is encouraged.

20.3.4 Illumination Requirements

The Design-Builder shall comply with the illumination requirements in the *Caltrans Traffic Manual* under Highway Safety Lighting.

20.3.5 Lighting Fixtures

The Design-Builder shall coordinate with local agencies for lighting fixtures.

20.3.6 Bicycle and Pedestrian Facilities Plan

The Design-Builder shall prepare a Bicycle and Pedestrian Facilities Plan that indicates the following, but not limited to, design features:

- Alignment;
- profile;
- cross-section;
- materials of bicycle and pedestrian facilities;
- the points of connection to existing bicycle and pedestrian facilities;
- signing and pavement markings;
- separation between bicycle or pedestrian facilities and the nearest travel lane; and,
- Where applicable, the methods of illumination by indicating light fixture locations and types and demonstration through photometric analysis that the illumination meets the stated requirements.

The Design-Builder shall prepare all necessary engineering studies and applicable design reports to justify the project bicycle and pedestrian facilities used in the project.

20.3.7 Requirements with Other Agencies

The Design-Builder shall refer to City of San Diego requirements section in these Technical Provisions for the design of bicycle and pedestrian facilities for local streets having jurisdiction over such facilities. The Design-Builder shall design and construct all sidewalks and trails shown on the Preliminary Design Drawings.

20.4 Construction Requirements

The Design-Builder shall be responsible for construction of all work described in this Section 20.

20.5 Deliverables

The Design-Builder shall submit Released for Construction plans to the Department for approval. The Design-Builder shall submit Released for Construction plans to the local governing agencies for review.

21 PAVEMENTS

21.1 General

The Design Builder shall perform all Work necessary to meet the requirements to design and construct pavement for all roadways in accordance with the requirements of this provision. Design and construct the project in accordance with requirements of this specification, including performance requirements, standards, warranties, design and construction criteria, maintenance during construction, and required submittals. The Design-Builder shall coordinate with the 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 Proposals (RFP) issue date unless otherwise specified herein or modified by addendum or change order.

Roadway Pavement Standards and Requirements

Priority	Agency	Title
1	Department	Pavement Policy Bulletins
2	Department	Design Information Bulletins
3	Department	Highway Design Manual
4	Department	Life Cycle Cost Analysis Procedures Manual
5	Department	District Pavement Policies and Standards
6	Department	Standard Special Provisions
7	Department	Standard Plans 2006
8	Department	Design-Build Modifications to the Standard Specifications for Construction
9	Department	Standard Specifications May 2006
10	Department	Technical Memoranda
11	Department	California Test Method and Lab Procedures
12	Department	Plans Preparation Manual

21.2.2 References

Use the references listed below as supplementary guidelines for the roadway pavement analysis and design. These references are not mandatory on the Design Builder.

Roadway Pavement References

Agency	Title
Department	Pavement Technical Guidance
Department	California Department of Transportation Pavement Website
AASHTO	Guide for Design of Pavement Structures and 1998 Supplement
Department	Ready to List and Construction Contract Award Guide (RTL Guide)
Department	Maintenance Technical Advisory Guide

21.2.3 Engineering Documents

Exhibit 21-A shows the proposed pavement design for the Project. Verify all information prior to use. Any information, such as traffic projections, equivalent single axle load projections, or changes to pavement standards and policies, that would require modifying the proposed pavement design shall be brought to the attention of the Department for approval prior to initiating work.

The Design-Builder shall not make Project changes that alter the essential functions and characteristics of the Project, such as safety, pavement design life, traffic operations, durability, desired appearance, maintainability, environmental protection, drainage, and other permitted constraints; without obtaining the prior approval of the Department including any necessary design exception or exemptions. Design-Builder shall perform the Work in accordance with the Standards and Requirements set forth in these Technical Provisions unless the Design-Builder obtains a deviation or Exception to those Standards or Requirements in accordance with the design review process set forth in the Design-Build Contract.

21.2.4 Software Requirements

The Design-Builder shall utilize statewide approved roadway pavement software for analyzing and developing details for the pavement structure recommendations in Attachment_1_ listed in the following Department website:http://www.dot.ca.gov/hq/maint/Pavement/Offices/Pavement_Engineering/Software.html

The Design Builder may at its own discretion use any software when submitting plans for approval but shall submit the final drawings in MicroStation SE and CAiCE Version 10SP6 formats as the drafting and design software, respectively.

21.2.5 Equipment Requirements

The Design-Builder shall use profilograph and falling weight deflectometers for field measurements of pavement. The equipment shall meet the requirements of California Test Method CT 526 and 356 respectively and shall be calibrated in relation to Department equipment..

21.2.6 Personnel Requirements

The Design Builder shall provide a Pavement Engineer who performs pavement calculations, develops pavement structure recommendations, details, or plans. The Pavement Engineer shall be licensed in the State of California and shall have a minimum of five (5) years experience in structural pavement design.

21.2.7 Certification Requirements

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

21.2.8 Meetings

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

21.2.9 Coordination with Other Agencies and Disciplines

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

21.3 Design Requirements

21.3.1 Roadway Pavement Concept Meeting

The Design-Builder shall schedule and participate in a Roadway Pavement Concept Meeting to present the strategy for the proposed pavement structural recommendations on the Project to the Department. The Design-Builder shall use the outcome of the meeting to finalize the pavement needs of the Project.

21.3.2 Roadway Pavement Analysis and Design

The Design-Builder shall design, construct, and where applicable, maintain pavements. The Design-Builder shall follow all standards and guidance listed in this provision and as described in the *Caltrans Highway Design Manual* (particularly Chapters 600 to 670) in preparing pavement plans, specifications, and estimates. The Design-Builder shall provide a pavement design based on the designs in Attachment _1_and that meets the following performance requirements:

- Provide a pavement Design-Life per Chapter 610 of the *Highway Design Manual*
- Provide a durable maintainable pavement system that meets or exceeds pavement design life criteria with the specified structural capacity; skid resistance, and superior ride quality
- Include pavement-to-structure transition areas as a part of ride quality. Use geogrid under the approach and departure slabs extending to any new adjacent pavement slabs.
- Minimize pavement-to-structure transition deviations
- Minimize pavement type-to- pavement type transition deviation
- Minimize rutting, and maximize maintainability at intersections
- Provide bridge pavement approach slabs per Chapter 670 of the *Highway Design Manual* and associated publications.
- Provide free-draining pavement sections both above and beneath the pavement surface for pavement constructed on this Project. Do not exacerbate subgrade moisture below existing pavement that is left in place, and
- Finished pavement shall conform to Caltrans Standard Specifications

The Design-Builder shall analyze and prepare separate pavements designs, as applicable, for locations not covered in Exhibit 21-A_ such as temporary construction areas.

21.3.4 Pavement on Local Roads

The Design-Builder shall design local streets and roads to carry projected traffic loads in conformance to the City of San Diego_ Standards. Subsurface drainage outlets shall not cross roadways. Left and right side subsurface drainage systems shall not use a common outlet pipe.

21.3.5 Special Pavement Designs

Special roadway pavement designs shall be fully justified and submitted for approval. Special roadway pavement designs are defined as those that meet either or all of the following criteria:

- Involve products, methods, or strategies that either reduce the structural thickness to less than what is determined by the standards set forth in this provision.
- Utilize experimental products or procedures not covered in the engineering tables or methods found in the standards set forth in this provision.

The Design-Builder shall submit to the Department special designs for approval in accordance to the process described in Topics 82 and 606 of the *Caltrans Highway Design Manual*. Expected timelines for approval of special designs are:

- 30 days for exceptions to mandatory pavement design standards and for nonstandard modifications to existing standard special provisions.
- 90 days for application of new products or strategies not covered in the *Caltrans Standard Special Provisions* and *Standard Specifications* and for new nonstandard special provisions.
- 120 days for use of experimental or nonstandard design procedures.

21.3.6 Materials Report

For any modifications to the design for locations not covered in the designs in Exhibit 21-A the Design-Builder shall prepare a Materials Report in accordance to Topic 114 of the *Caltrans Highway Design Manual* and submit to the Department for approval.

21.3.7 Supplemental Pavement Requirements

21.3.7.1 Pavement Compaction

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

21.3.7.2 Profile Index

The pavement surface shall be profiled, in accordance with the *Caltrans Standard Special Provisions* and *Standard Specifications*.

21.3.7.3 [NOT USED]

21.3.7.4 Tapers and Transitions

The Design-Builder shall design and construct tapers and transitions in accordance with the *Pavement Tapers and Transition Guide* (http://www.dot.ca.gov/hq/esc/Translab/ope/Pavement-Tapers-&-Transitions-Guide.pdf). Where project abuts a previously overlaid segment of roadway, the taper of the Project shall overlay the taper placed on the previous overlay to provide a smooth transition.

21.3.7.5 Pavement Widening

In addition to the Standards and Requirements in 21.2.1, pavement widening design shall be in accordance with Pavement Policy Bulletin 10-1 *Pavement Design for Widening Projects.* In addition, the adjacent lane to the widening shall be repaired and rehabilitated as needed to match the pavement design life of the widening in order to provide a smooth transition between existing and new pavement. For concrete pavements, if more than 5% of the slabs in the lane adjacent to the widening require replacement in accordance with the *Slab Replacement Guidelines*, then a life cycle cost analysis shall be in done in accordance with Design Information Bulletin 81 *CAPM Guidelines* and the *Life Cycle Cost Analysis Procedures Manual.* If the life cycle cost analysis indicates that lane replacement is more cost effective, the adjacent lane shall be replaced in accordance with the *Jointed Plain Concrete Pavement Rehabilitation and Preservation Guide.*

21.4 Construction Requirements

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

21.4.1 Pavement Evaluation on Ride Quality and Skid Resistance

The Design-Builder shall evaluate ride quality in all lanes and shoulders using a profilograph as indicated in *Caltrans Standard Special Provisions*. The Design-Builder shall supply the profilograph and the Certified Qualified Operator (CQO) certified results. Department will use the CQO certified results to determine Substantial Completion of pavement work. A verification of the ride quality may be conducted. The Department will evaluate skid resistance. Existing skid resistance on pavement that remains in place shall not be reduced. Pavements placed by the Design-Builder shall provide a skid resistance value greater than 50.

21.4.2 Removal of Pavement

Existing PCC and AC pavement of the traveled way and shoulders, to be removed, shall be removed without affecting the adjacent pavement to remain. In the event material underlying removed pavement is disturbed, it shall be recompacted to a relative compaction of not less than 95 percent.

21.4.3 Local Standards

For roadways adjacent to and crossing the Project that are disturbed by the construction activities, the Design-Builder shall match the in-place surface type and structure of the existing roadways, unless otherwise specified in these Technical Provisions. The Design-Builder shall design and construct all tie-in work to avoid differential problems, accounting for such factors as total surfacing thickness, minimum structural requirements, unbound base/subbase thickness, and frost-free characteristics. The Design-Builder shall reconstruct the disturbed areas based on the standards and specifications of the City of San Diego. In ditches with less than 0.3% grade or ditches suspected of having standing water, the Design-Builder shall provide subsurface drains and headwalls. Six-inch drain tile shall be installed with a minimum cover of 12 inches.

21.5 Deliverables

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

21.5.1 Materials Design Recommendation

The Design-Builder shall submit one hardcopy of the documentation for the Materials Design Recommendation accepted by the Department as well as subsequent updates of construction changes to the pavement structure. The documentation shall, at a minimum, contain:

- Pavement design life (including both the construction year and design year),
- The California R-values and unified soil classification of the subgrade soil
- The California R-value(s) or strength properties for the materials selected for the subbase and/or base layers
- The Traffic Index (TI) for each pavement structure
- Depth and type of pavement
- Depth and type of subbase and/or base layers

The Design-Builder shall include on the first sheet of the project typical section plan sheets, the project design designation information in accordance with Topic 103 of the *Caltrans Highway Design Manual.*

21.5.2 Materials Report

The Design-Builder shall submit one hardcopy of the Materials Report. The Materials Report shall be prepared in reference to Topic 114 of *Caltrans Highway Design Manual*.

21.5.3 Over-the-Shoulder Design Documents

During the design process, any submittals required in the Design Standards or other Contract Documents shall be prepared by the Design-Builder. Submittals shall be in an acceptance format and organized to facilitate their review.

21.5.4 Released for Construction (RFC) Documents

The Design-Builder shall produce plans and specifications in a format that aids and facilitates design review , and provide adequate information for safe, efficient, and high-quality construction. Plan sets and sheet types shall be developed in accordance with the *Caltrans CADD Standards*, *Caltrans Plans Preparation Manual*, and the Design Quality Management Plan before construction may begin. Approval for all RFC documents is required.

21.5.5 Final Design Documents

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

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

21.5.5.1 Design Justification Reports and Project Documentation

Upon request, the Design-Builder shall submit design justifications when the Design-Builder shall consider various factors or alternatives. Documentation may be computer generated or hand written and shall clearly identify the following:

- Design issue
- Items requiring consideration
- Basis for evaluation
- Final decision and justification

For justifications that require exceptions to pavement mandatory standards as found in the *Caltrans Highway Design Manual* and *Pavement Policy Bulletins,* an *Exception to Mandatory Pavement Design Standard* shall be prepared and submitted for approval. Other justifications that qualify as special designs per Topic 606 of the *Caltrans Highway Design Manual* shall be submitted in accordance with the submittal requirements in Topic 606.

The Design-Builder shall prepare and submit bound design calculations and Project documentation. These submittals shall be in indexed paper or electronic format, organized by design topic, and delivered to the Department.

21.5.5.2 Non- Standard Specifications and Non-Standard Special Provisions

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

21.5.6 As-Built Documents

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

21.5.7 Profilograph and Data Core Data

The Design-Builder shall submit profilograph data and data cores as completed in accordance with Sections 39 and 40 of the *Caltrans Standard Specifications* and associated standard special provisions.

21.5.8 Quality Control Documents

The Design-Builder shall submit quality control reports and test results as completed in accordance with Sections 39 and 40 of the *Caltrans Standard Specifications* and associated standard special provisions.

EXHIBIT 21-A

Proposed Pavements Design

This document is provided as an electronic file

22 STORMWATER

22.1 General

The Design-Builder shall perform all Work necessary to meet the requirements associated with stormwater, including permanent and temporary best management practices such as retention/detention facilities, conveyances, erosion control, protection of downstream water bodies, sampling, erosion control, permit compliance, and overall water quality protection in accordance with all applicable state and federal regulations.

22.2 Administrative Requirements

22.2.1 Standards

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

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

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

Use the most current version of each listed standard as of the Request for Proposals (RFP) issue date unless otherwise specified herein or modified by Addendum or Change Order.

Stormwater Standards

Priority	Agency	Title
1.	Department	Standard Special Provisions
2.	Department	Standard Specifications May 2006
3.	Department	Standard Plans 2006
4.	Department	Highway Design Manual
5.	Department	Project Planning and Design Guide (PPDG)
6.	Department	Caltrans Treatment BMP Design Guidance Documents
7	Department	Caltrans Storm Water Management Plan
8	Department	Construction Site Best Management Practices (BMPs) Manual
9.	Department	Stormwater Pollution Prevention Plan (SWPPP) and Water Pollution Control Program (WPCP) Preparation Manual
10.	Department	Construction Site Stormwater Quality Sampling Manual
11.	USDA	Revised Universal Soil Loss Equation, Version 2 (RUSLE II)
12.	Department	Construction Manual

22.2.1.1 Permits

1. Caltrans NPDES Permit 99-06-DWQ (.Permit in effect on the Proposal due date)
2.
3. NPDES General Permit For Storm Water Discharges Associated with Construction 2009-0009-DWQ (CGP 2009-0009-DWQ effective July 1, 2010)

   Dewatering permit under the San Diego Regional Water Quality Control Board (SDRWQCB)

4. Project Specific 404 Permit related to stormwater
5. Project Specific 401 Certification requirements related to stormwater
6. Project Specific Fish and Game 1601 requirements related to stormwater

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)

22.2.3 Preliminary Engineering Plans

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

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

Best Management Practices design shall follow the most current version of the *Caltrans Project Planning and Design Guide (PPDG)* and design guidance documents. The Design-Builder may use the plans and specifications developed by the Department or they may choose to develop a special design to fit the project needs with coordination and approval of the Department. The intent is to provide some flexibility in the size or shape of the existing approved BMPs, but not to use proprietary devices that have not been tested for effectiveness by the Department. Proprietary devices may only be used with prior approval of the Department and with appropriate testing information to assure that they are feasible long-term for a Department facility. The stormwater design shall include a feasibility analysis of BMPs to document that the NPDES permit threshold for compliance of Maximum Extent Practicable (MEP) has been met.

All approved treatment BMPs have guidance, plans sheets, and specifications developed by the Department. This information is available on the Department Storm Water webpage: http://www.dot.ca.gov/hq/oppd/stormwtr/index.htm.

22.2.4 Software

The Design-Builder shall prepare drawings in MicroStation and provide a copy in adobe acrobat to share with other agencies that do not have Microstation. The Storm Water Data Report (SWDR) shall be submitted in Microsoft Word, Microsoft Excel, and Adobe Acrobat formats.

22.2.5 Stormwater Data Collection

The Design-Builder shall follow the PPDG in the preparation of the SWDR. The PID and PA/ED level SWDR information (Exhibit22- 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. In addition, the SWDR should include all tables and drainage area calculations as required by the Department in all of the recent SWDR. The Department may require additional documentation not listed in the PPDG.

Treatment design analysis should be done for each watershed and drainage system as required under the PPDG.

22.2.6 Coordination with Other Agencies and Disciplines

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

The Design-Builder shall comply with and document the permit requirements, modifications, and contacts with the permitting agencies. The stormwater design should be based on the Department standards, plans, specifications, guidance, and permits. Local standards for stormwater design do not always meet the Department's threshold for feasibility or may not be appropriate for the highway environment due to many competing standards the Department must meet including, but not limited to safety, aesthetics, and maintenance.

22.2.7 Training Qualifications and Certification

The Design-Builder shall provide staff with qualifications and certifications related to development of plans, specifications, reports, and construction related stormwater requirements in local, state, federal, and 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.
- California Registered Civil Engineer Stamp on final SWDR
- A Qualified SWPPP Developer (QSD) in accordance with Section VII of the CGP 2009-0009-DWQ.
- A Qualified SWPPP Practitioner (QSP) 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 downstream effects of the project hydrology and document them in the SWDR. The post project hydrology should include the treatment BMPs as they will help reduce the water quality impacts of changes in flows, volume, and chemistry.

22.3.2 Permanent Stormwater Treatment BMPs

The Design-Builder shall design stormwater treatment systems to meet requirements for water quality, water quantity, and rate control, as determined by local, State and federal requirements and the Department NPDES regulations. This includes but is not limited to Caltrans Permit (Order No. 99-06-DWQ) (NPDES Permit) and the Construction General Permit (Order No. 2009-0009-DWQ) (CGP). Design Builder will comply with the provisions of Caltrans Permit (Order No. 99-06-DWQ) which is in effect on the Proposal due date.

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. This would include but not be limited to Low Impact Development (LID) and hydromodification.

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 watershed areas, flows, and volumes used to design and size BMPs, which may not always be in the drainage report.

22.3.3.3 Bioswales and other Permanent Treatment BMP's

The Design-Builder may use Bioswales, 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. Biowales are an approved treatment BMP, but care must be taken in the design to provide stable BMPs so that a long term erosion problem does not occur. This includes ensuring that slopes within the treatment drainage area are stabilized for proper treatment efficiency of the Bio-swale. Permanent BMPs that use rip rap need to be designed in such a way that stormwater dissipates within 72 hours. In all treatment BMPs, stormwater is to be designed to dissipate within 72 hours.

22.4 Construction Requirements

The stormwater requirements shall be in accordance with the latest approved Caltrans NPDES permit (currently 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.

Construction site water pollution control shall include BMPs in the plans, specifications, SWDR, and SWPPP 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.

22.5 Deliverables

22.5.1 Project Drainage Overview Map

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

22.5.2 Released for Construction Documents (RFC)

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

Storm Water Data Report (follow Caltrans PPDG for equivalent of PS&E level SWDR and must be stamped)

Electronic Excel SWDR and TMT submittal for tracking BMPs for design compliance monitoring (2 spread sheets)

SWPPP in accordance with CGP

Risk Assessment in accordance with CGP

Temporary and permanent erosion control plans

Temporary and treatment BMP plans

Specifications, Special Provisions, and Non-Standard Special Provisions

22.5.3 Construction General Permit

As part of compliance with the CGP, the Design-Builder shall:

File all construction general permit registration documents (PRD's) with state board using the Storm water Multi Application Reporting and Tracking System (SMARTS).

a) Notice of Intent (NOI)
b) Risk Assessment (CGP Section VIII)
c) Site Map
d) Storm Water Pollution Prevention Plan (CGP Section XIV)
e) Signed Certificate Statement

- Prepare and pay the annual fee until Project Final Acceptance and complete Rain Event Action Plans (as required)
- Annual Reports (CGP Section XVI).
- Monitoring requirements

- Submit and file the Notice of Termination at the Completion of the project

Copies of the documents shall be provided to the Department.

22.5.3.1 Drainage Plans

As part of the drainage plans, show the locations of all 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 treatment 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, 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 the Department 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 the Department with a Storm Water Data Report signed by a California-licensed Professional Engineer. Additionally the Design-Builder shall provide a drainage report documenting all the drainage computations, both hydrologic and hydraulic, and all support data required for the drainage design. The SWDR shall include all the pertinent stormwater information required in the PPDG, including the spreadsheets in the correct format for the Department to track the treatment BMPs.

22.5.5 As-Built Plans

Upon completion of the Project, the Design-Builder shall deliver to the Department a complete set of As-Built Documents and design files that incorporate all design changes and details of Accepted Work that occurred throughout the Project including all stormwater treatment BMPs. The As-Built plans shall be signed by a licensed California Civil Engineer. Additionally a spreadsheet listing all treatment BMPs with Post Mile (PM) is to be submitted

EXHIBIT 22-A

PA&ED Stormwater Data Report

This Document is provided as an electronic file

23 RAMP METERING AND TRAFFIC MONITORING SYSTEMS

23.1 General

The Design-Builder shall perform all Work necessary to meet the requirements for Ramp Metering and Traffic Monitoring Systems for the Project.

Design and construct the Ramp Metering and the Traffic Monitoring systems 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 if required.

23.2 Administrative Requirements

23.2.1 Standards

The Design-Builder shall design and construct the Ramp Metering and Traffic Monitoring systems in accordance with the requirements of the standards listed by priority below.

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

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

Use the most current version of each listed standard as of the Request For Proposals (RFP) issue date unless otherwise specified herein or modified by Addendum or Change Order:

23.2.1 Ramp Metering Standards and Requirements

Priority	Agency	Title
1	Department	Ramp Meter Design Manual
2	Department	Signal Design Manual
3	Department	2007 Signal, Lighting, and Electrical System Design Guide
4	Department	Signal Design Detail Sheets
5	Department	Traffic Manual
6	Department	Special Provisions and Non-Standard Special Provisions
7	Department	Standard Plans May 2006
8	Department	Design-Build Modifications to the Standard Specifications
9	Department	Standard Specifications May 2006
10	Department	Various Technical Memoranda
11	Department	CADD Users Manual

12	Department	Plans Preparation Manual
13	AASHTO	Roadside Design Guide

23.2.2 References

Use the references listed below as supplementary guidelines for the design and construction of the ramp metering facilities. These references are not binding on the Design-Builder.

Ramp Metering References

Agency	**Title**
Department	Standard Plans, Signal and Lighting Design Guide
Department	CADD Data Standards (Traffic Signal Cell Library)
Department	New Policy and Directives (Pavement Delineation and Signing)

23.2.3 [NOT USED]

23.2.4 Preliminary Engineering Documents

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

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

23.2.5 Software Requirements

The Design-Builder may at its own discretion use any software when submitting plans for approval but shall prepare final drawings using MicroStation SE and CAiCE Version 10SP6 as the drafting and design software, respectively.

23.2.6 Meetings

The Department and the Design-Builder shall meet at the request of either party, as necessary, to discuss and resolve matters relating to ramp metering and traffic monitoring Work during the design and construction stages. The requesting entity shall provide the other entities 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.

23.2.7 [NOT USED]

23.2.8 Certification Requirements

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

26.3 Design Requirements

Design, furnish, and install all components of a ramp metering and traffic monitoring 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.

26.3.1 Ramp Metering/ Traffic Monitoring System Concept Meeting

The Design-Builder shall take an inventory of all the existing Ramp Metering and Traffic Monitoring System elements within the Project limits. A detailed list including the type of detection and communication of all existing Ramp Metering/Traffic Monitoring System field elements will be developed and illustrated on the plans. The Design-Builder shall schedule and participate in a Ramp Metering/ Traffic Monitoring System concept meeting to present a layout of the in-place and proposed Ramp Metering/Traffic Monitoring Systems on the Project to the Department. The Design-Builder shall use the outcome of the meeting to finalize the Ramp Metering / Traffic Monitoring System needs of the Project**.**

23.3.2 Ramp Metering Design Requirements

Ramp Metering Work shall meet the requirements in the *Caltrans Ramp Meter Design Manual*. The Design-Builder shall design all temporary ramp-metering systems to comply with the same design and construction requirements of the permanent ramp metering systems. The Design-Builder shall prepare all necessary engineering studies and applicable design reports to justify all the project ramp metering elements used in the project. All Exit Ramp Detector Loops (Off-Loops) should be installed in a single lane Ramp where lane is full width, and should be connected to the nearest on-ramp controller cabinet in the same traffic direction.

23.3.4.3 Specific Requirements

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

- When cutting mainline loops, the loop wires for all lanes shall be split evenly where half go to the pull box in the left shoulder and half go to the pull box in the right shoulder.
- A Maintenance Vehicle Pullout (MVP) shall be installed for every Ramp Metering System (RMS), and Traffic Monitoring System (TMS), and Closed Circuit Television (CCTV) cabinet location. All loops shall be cut on the final layer of the roadway for verification purposes.
- All signal heads shall be 12 inches except if a 1A pole is used with both upper and lower signal sections. When using a 1A pole, the lower signal heads shall be 8 inches.
- No Detector Lead-in Cable splices shall be allowed.
- No communication (phone line) splices shall be allowed.

23.3.4.4 Electrical Requirements

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

23.3.4.5 Electrical Service

Service for all elements shall be standard 120/240-volt (V) service. Design-Builder shall be responsible for obtaining new or modified electrical service and telephone service points, including all applications and permits required from the serving utility company, and XY standard forms in the case of new telephone services.

Separate service conduits shall be used for lighting circuits, Traffic Monitoring Systems (TMS), Ramp Metering System (RMS), Closed Circuit Television (CCTV), and from the service cabinet meter to the load. Large conduits with inner ducts to route the conductors for these separate circuits will not be acceptable.

Design-Builder shall be responsible for all electrical utility costs of the new or modified system, unless otherwise stated, following any change in loading on an existing meter, relocation of a meter, or installation of a new meter. This responsibility shall continue until Project Acceptance. The Department shall pay for existing power for the mainline and ramp lighting as long as the existing lighting is in use. Notify the Department at least seven (7) days before disconnecting the existing lighting from power. At each location where temporary lighting will be provided, the Design-Builder shall pay the temporary lighting costs until the final lighting facilities are in place and have been accepted. The Department will then resume payment responsibility for power for lighting.

23.4 Construction Requirements

Construction shall be in accordance with the requirements of the *Standard Specifications* and the Special Provisions. The Design-Builder shall use Materials listed on the Caltrans Approved Products List for Work Zones and ramp metering. The Design-Builder shall obtain the current Approved Products List.

23.4.1 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 will receive a response within 15 days.

23.4.2 Ramp Metering/Traffic Monitoring Systems

The Design-Builder shall provide maintenance for permanent or temporary ramp metering/traffic monitoring systems impacted within the project limits until Substantial Completion of the Project. All existing ramp metering/traffic monitoring systems shall be operational at all times throughout the duration of the contract.

Prior to any traffic shift that impacts the ability of the Department to obtain accurate mainlane data, Design Builder will perform an advance site survey to determine the proper location for the placement of the poles to be used for any temporary side-radar detection. Temporary side-radar detection must be reconfigured throughout the duration of the contract when the lane configuration is changed or the traffic data becomes inaccurate.

If existing ramp metering operations are interrupted in order to perform the Work, Design Builder shall provide video detection at the onramp until permanent detection is installed.

If necessary in order to keep both ramp metering/traffic monitoring systems operational, Design Builder shall utilize both solar power and/or wireless communications.

23.4.3 Source of Power

The Design-Builder shall coordinate with the local power supplier to provide the power service connection. The Design-Builder shall pay all costs, unless otherwise noted, charged by the electric power companies for providing power connections. The Design-Builder shall be responsible for contacting the electric utility to

determine the source of power, to obtain exact locations of power poles and stub-outs for the permanent and temporary installations. If

23.5 Deliverables

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

23.5.1 Ramp Metering Concept Plan

The Ramp Metering Concept Plan (permanent or temporary) with incorporated comments received at the Ramp Metering Concept Meeting shall be submitted 60 days after the concept meeting.

23.5.2 Over-the-Shoulder Design Documents

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

23.5.3 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 ramp metering RFC Documents is required.

23.5.3 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
- Ramp capacity analysis
- Reports/Project documentation
- Specifications and Special Provisions

23.5.4 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 ramp metering structures shall be submitted for Approval prior to fabrication.

23.5.5 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

23.5.6 Non- Standard Specifications and Non- Standard Special Provisions

If the Design-Builder requests 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.

23.5.7 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.

24 RAILROAD

24.1 General

The Design-Builder shall be responsible for the coordination with Metropolitan Transit System (MTS) and North County Transit District (NCTD) for all design and construction requirements on railroad right of way (R/W). The Design-Builder shall coordinate and develop design plans including, without limitation, all procedures necessary to construct and maintain the grade separation. The Design-Builder must verify with MTS/NCTD Local Representatives for the latest version of their requirements prior to developing Construction Documents. The Design-Builder shall also coordinate with Burlington Northern Santa Fe (BNSF) and Amtrak, users of the track. Design-Builder shall be responsible for obtaining Letters of Concurrence for the improvements from BNSF and Amtrak.

The Design-Builder is responsible for obtaining and complying with all applicable design and construction specifications and requirements. The Design-Builder is responsible for performing the work in accordance with the terms and conditions specified in the executed Construction and Maintenance (C&M) Agreement prior to the commencement of any construction activities. This responsibility includes, without limitation, compliance with all Railroad requirements, Federal, State and Local Laws and applicable county or municipal ordinances and regulations, and the California Public Utilities requirements (CPUC). Also, the Design-Builder will be responsible for all railroad cost associated with this project to include, but not limited to, crossing surfaces, track materials, insurance, traffic control, public outreach, preliminary engineering flagging, and design reviews.

24.2 Construction within Railroad Right of Way

The Contractor shall obtain a Right of Entry Permit from the Railroad (Metropolitan Transit System) and, if necessary, its railroad tenant prior to start of construction. The Contractor shall abide by the terms of the Right of Entry Permit. The terms of the Right of the Entry Permit will govern if there are any conflicts with these technical provisions. Information on obtaining a Right of Entry Permit can be obtained at http://www.sdmts.com/business/permits/asp.

The Metropolitan Transit System (MTS) and North County Transit District (NCTD) are the permitting authority for all structure design, demolition, construction staging, falsework and shoring plans, as pertaining to railroad R/W. All work required on structures over or under railroads, will be in accordance with MTS/NCTD Standards and References, Performance Requirements, design and construction criteria, State requirements for structures, and CPUC railroad requirements. The Design-Builder shall construct both temporary and permanent structures in accordance with those criteria, as necessary and to cause no interruption to Railroad operations and safety impairment during and after construction.

If there is any unresolved ambiguity in standards, the Design-Builder shall be responsible to obtain clarification and resolution from MTS/NCTD before proceeding with design and/or construction.

24.3 MTS and NCTD Coordination

This section describes the special requirements for coordination with MTS and NCTD to comply with their standard operating procedures whenever work is to be performed within railroad R/W or impact current or future railroad operations. The Design-Builder shall coordinate with MTS and NCTD while performing the work outlined in this Contract. All submittals and work will be completed in compliance with California Public Utilities General Orders, Codes, laws, Polices, Rules of Practice and Procedures, MTS/NCTD Requirements, Federal Railroad Administration (FRA) rules and regulations, and American Railway Engineering and Maintenance-of-Way Association (AREMA) recommendations as modified by these minimum special requirements or as directed in writing by the MTS/NCTD Designated Representative. The

MTS/NCTD Designated Representative will be the person or persons delegated by MTS/NCTD to handle specific tasks related to the Project.

24.3.1 MTS Contact Information

Metropolitan Transit System

Mr. Tim Allison, P.E.

Delegated Representative (Manager of Real Estate Assets)

1255 Imperial Avenue, Suite 1000

San Diego, CA 92101

(619) 595-4903

www.sdmts.com

24.3.2 NCTD Contact Information

North County Transit District

Mr. Ed Singer

Delegated Representative (Real Estate Asset Administrator)

810 Mission Avenue

Oceanside, CA 92054

(760)966-6556

www.gonctd.com

24.3.3 BNSF Contact Information

Mr. Melvin V. Thomas

Manager Public Projects

740 East Carnegie Drive

San Bernardino, CA 92408

(909) 386-4472

24.3.4 Amtrak Contact Information

Mr. Richard Guy

Project Director, Real Estate Development

530 Water Street, 5th Floor

Oakland, CA 94607

(510) 238-2615

24.4 Requests for Information/Clarification

All Requests for Information (RFI) involving work within any MTS/NCTD R/W will be in accordance with the procedures listed in the documents and as follows:

- All RFIs will be submitted by the Design Manager.
- The Design Manager will submit the RFI to the MTS/NCTD Designated Representative for review and approval of work within the MTS/NCTD R/W. A copy of the RFI shall be submitted to the Department for information.

24.5 Railroad Operations

Design-Builder shall arrange and conduct all work in such manner and at all times that will not endanger or interfere with the safe operation of the tracks and property of MTS/NCTD, the traffic moving on such tracks, or the wires, signals and other property of MTS/NCTD, its tenants or licensees, at or in the vicinity of the work. MTS/NCTD will be reimbursed by Design-Builder for train delay costs, damages, and lost revenue claims due to Design-Builder's construction work, failure to comply with MTS/NCD requirements, or other activities.

The Design-Builder is hereby put on notice that trains and/or equipment are expected to be on any track, at any time, and in either direction. The Design-Builder shall be familiar with the train schedules in all impacted locations and shall structure its schedule assuming intermittent track windows. Flagging service may be required and as determined by the railroad. If possible, the Design-Builder shall request for a temporary track shutdown prior to making a request for flagging service from MTS/NCTD.

All railroad tracks within the Contract Site are active, and rail traffic over these facilities must be maintained throughout the impacted Project limits. Railroad traffic and operations will occur continuously throughout the day and night on those tracks and must be maintained at all times. Coordinate and schedule the work so that construction activities do not interfere with railroad operations. Work windows for this Contract will be coordinated for approval with the MTS/NCTD Designated Representatives.

24.6 Insurance and Agreements

24.6.1 Insurance

The Design-Builder shall not commence any work on the Railroad right of way until all agreements have been executed, insurance acquired and approved by railroad and Department, and all RFC plans have been approved by MTS/NCTD. The Design-Builder shall be responsible for obtaining the appropriate insurance and/or coverage required by the Railroads. The required insurance will be kept in full force and effect during the performance of work and thereafter until Design-Builder removes all tools, equipment, and material from MTS/NCTD's property and cleans the premises to a condition prior to Project and to the satisfaction of MTS/NCTD.

24.6.2 Agreements

The fee for processing railroad agreements will be borne by the Design-Builder. Submit a copy of the executed agreement and the insurance policies, binders, certificates and endorsements set forth therein to the Department and MTS/NCTD prior to commencing work on MTS/NCTD property. The Right of Entry Agreement will specify working time frames, flagging and inspection requirements, and any other items specified by MTS/NCTD. Anyone working on railroad's right of way will have completed the railroad safety training class and to the satisfaction of MTS/NCTD.

Any Overhead Structure crossing the Railroad will require an executed Construction and Maintenance (C&M) Agreement prior to the start of any construction activities on Railroad right-of-way. The C&M Agreement will not be signed without the Railroad's prior approval of final structure plans and construction documents. The Design-Builder shall comply with all of the terms and conditions of the C&M Agreement. The Design-Builder must submit 100% plans to the Railroad and the Department for review and written approval before a C&M Agreement is executed. The C&M agreement shall include a funding source, cost estimate, insurance and indemnification requirements, method of payment, responsibility for design,

construction, ownership, maintenance, and future modification work. C&M Agreement shall be signed by all parties that will be involved, in the construction and/or maintenance of the structures during and after construction. The Departments Division of Right of Way and Land Surveys, Office of Project Delivery, Railroad Agreements Unit and its Legal Department will review and approve all Construction and Maintenance Agreements.

The Design-Builder shall coordinate and develop all final draft C&M agreements involving the Department for execution through the State Railroad Agreements Engineer in the Railroad Agreements Unit. The Design-Builder is fully responsible for mediation and resolution of issues between the Department and MTS/NCTD and accepts this work as part of the agreement development activity.

24.7 Work Stoppages

Should a condition arising from, or in connection with the work, require that immediate and unusual provisions be made to protect operations and property of MTS/NCTD, the Design-Builder will make such provisions. If in the judgment of MTS/NCTD Designated Representative such provisions are insufficient, the MTS/NCTD Designated Representative may require or provide such provisions as deemed necessary. In any event, such provisions will be at the Design-Builder's expense and without cost to the Department or MTS/NCTD. MTS/NCTD and/or Department will have the right to order the Design-Builder to temporarily cease operations in the event of an emergency or, if in the opinion of the MTS/NCTD Designated Representative, the Design-Builder's operations could endanger public safety or MTS/NCTD operations. In the event such an order is given, Design-Builder will immediately notify the Department of the order.

24.8 Coordination with Railroad

All work to be performed by the Design-Builder on railroad right of way shall be done in a manner satisfactory to the railway companies. The Design-Builder shall use all care and precautions to avoid accidents, damage, unnecessary delays, or interference with the railroad company's operations.

When the Design-Builder is required by the plans or special provisions to transport materials or equipment across the tracks of any railroad or to perform work on railroad right of way, the Design-Builder will obtain all necessary written authority from the railroad companies for the establishment of a railroad crossing or for the performance of work on railroad right of way. The Design-Builder will be required to bear the cost of all watchman service or flagging protection necessary due to such operations, as the railroad companies will be reimbursed directly by the Design-Builder for the cost of such work. The Design-Builder must pay railroad within 45 days after receipt of invoice, unless disputed. Design-Builder shall resolve all disputes promptly within 14 calendar days of the dispute notice from Design-Builder to MTS/NCTD. All invoices and payment records shall be kept and be made available to the Department or Railroad for audits upon request within seven (7) days.

In case the Design-Builder elects or finds it necessary to transport materials or equipment across the tracks of any railroad at any point where a crossing is not required by the plans or special provisions, or at any point other than an existing public crossing, he shall obtain specific written authority from the railroad companies for approval. With regards to the establishment of a private railroad crossing the Design-Builder shall bear all costs in connection with such crossing, including installation, drainage, maintenance, any necessary insurance, watchman service, flagging protection, security measures, and the removal of such private railroad crossing when it is no longer required.

24.9 California Public Utilities Commission

The Design-Builder shall be fully responsible for the coordination and the preparation of all deliverables to complete all appropriate applications with the California Public Utilities Commission (CPUC). The Department shall be responsible for the filing the applications, as required by the CPUC. AS part of the application process, the Design-Builder shall be responsible for obtaining Letters of Concurrence from the

users of the tracks, BNSF and Amtrak, before the formal application is submitted to the CPUC. Without Letters of Concurrence, the users could protest the formal application and cause delays in getting the application approved.

The authority to construct a new crossing is granted by an Order from the CPUC through a "formal application" process, which will result in a Decision signed by the Commission. The Design-Builder shall contact and work with the Commission's Rail Crossings Engineering Section prior to making any formal application for new crossing. CPUC staff will be able to advise and assist in assuring the application is complete and minimize the chances of other parties protesting the application, or it being rejected by the CPUC Docket Office. The Design-Builder must have final approved project environmental document and preliminary structure plans showing all railroad impacts before a "formal application" can be filed and accepted by CPUC. The Design-Builder is cautioned the process with the CPUC and the execution of C&M Agreements with the railroad is very time extensive. This shall be fully taken into consideration in the project schedule and cost and be acknowledged by all stakeholders.