**STATE OF CALIFORNIA**
**DEPARTMENT OF TRANSPORTATION**

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# PROJECT REQUIREMENTS
# BOOK 2

## FOR DESIGN AND CONSTRUCTION ON STATE HIGHWAY IN

## LOS ANGELES COUNTY IN THE CITY OF BALDWIN PARK AT ROUTE 10/605 INTERCHANGE

**DISTRICT 07, ROUTE 10/605 INTERCHANGE**

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**CONTRACT NO. 07-245404**
**07-LA-10-PM 31.1/32.3**
**07-LA-605-PM R20.2/20.6**
**Project ID 0700000431**

**Federal Aid Project**
**NHI-X037(154)N**

**Dated: August 12, 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 modifications to the Department's Manuals, Special Provisions and Standard Specifications. Any Standards or Special Provisions not included in Book 3 shall not be used by the Design-Builder without prior Approval of the Department. In some instances, only specific sections of the given standard apply. These sections are specified in Book 2.

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

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

## 1.3 Project Description

### *1.3.1 Basic Configuration*

The Preliminary Design Drawings and the Advance Planning Study 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 alignments:
   - The horizontal alignments for the roadways may be changed unless otherwise indicated in the Contract Documents; however, the proposed change must be achievable within the Right of Way limits.
2. Lane and shoulder widths
3. Number of lanes
4. Location and number of roadway access points
5. Approximate location of Project limits

### *1.3.2 Project Limits*

The Project is located in Los Angeles County in the City of Baldwin Park. The construction Project limits are as follows:

- From Route 10 & 605 Interchange to 0.80 mile east of Route 10 & 605 Interchange at Route 10.

The lateral limits of the Project shall extend to the locations necessary to complete the Work and meet the Project requirements.

### *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 the interchange connector bridge, concrete paving, storm drain, sanitary sewer, water lines, oil/fuel lines and wells, minor grading, curb and gutter, concrete barrier, signals, lighting, and signage. Additional major responsibilities will be environmental management, public relations, and utility coordination, among other things. The Design-Builder will need to get a City permit to perform work on city streets including a sewer permit, if sewer work is necessary.

The Project will include:

- Construct a 12 foot lane bridge structure with 5 feet left shoulder and 10 feet right shoulder, branching off the southbound I-605 to westbound I-10 directional connector, going over I-605 and I-10 freeways, and joining back into eastbound I-10.
- Construct retaining walls along the southbound I-605 right of way, and at the beginning and end of the bridge abutments.
- Remove and reconstruct a portion of the existing soundwall and pile foundations in conflict with the proposed bridge column/footing locations and where connector joins the freeway along eastbound I-10 traffic.
- Re-stripe the joint segment of the westbound I-10 to southbound I-605 connector.
- Remove the southbound I-605 to eastbound I-10 connector.
- Landscape the disturbed area after the removal of the existing southbound I-605 to eastbound I-10 connector.
- Reconstruct southbound I-605 to westbound I-10 connector.
- Reconstruct Dalewood Street for approximately 1300 feet.
- Environmental compliance and mitigation
- Replacement, relocation, and new construction of water lines and sanitary sewers
- Drainage systems, including stormwater treatment systems
- Signing, striping, and lighting
- Business development and public information activities
- Erosion control including slope stabilization and stormwater pollution prevention.

This project requires right of way acquisition along Dalewood Street.

### *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.

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

Upon written request from the Design-Builder, the Department will furnish a list of ongoing contracts within the Project limits. The Department shall have 5 Working Days to provide the list.

:

| Contract No. | Co-Rte-PM | Location | Type of Work |
|---|---|---|---|
| 07-117074 | LA -10 -31.2 /33.2 | Los Angeles County (Baldwin Park): From I-10/I-605 Separation (approximately 14 miles of east of downtown Los Angeles) to West Covina Parkway | Widen the I-10 Freeway by adding one HOV lane and soundwalls in each direction, and replacing bridge overcrossings. Construction is currently underway. |
| 07-274404 | LA -10 -18.3 /31.2 | Los Angeles County: From downtown Los Angeles to I-10/I-605 Separation (approximately 14 miles east from downtown Los Angeles) | Construct and convert I-10 El Monte Busway HOV lanes (I-605 to Alameda St.) into High Occupancy Toll (HOT) lanes. Construction is currently underway. |

# 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, including payment breakdown on invoices and file structure for document control according to the activity breakdown provided in the Project Schedule.

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

### *2.1.3 Deliverables*

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

## 2.2 Cost Management

### *2.2.1 General*

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

### *2.2.2 Administrative Requirements*

#### 2.2.2.1 Payment Breakdowns

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

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

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

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

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

#### 2.2.2.2 Invoices

##### 2.2.2.2.1 General

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

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

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

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

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

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

#### 2.2.2.2.2 Invoice Calculations

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

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

The following Project Management items from Form 9 submitted with the 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 and Project History File 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.
   - Disadvantaged Business Enterprise (DBE) progress and Project updates
   - Equal Employment Opportunity (EEO) progress and Project updates
   - Update on labor compliance unresolved issues
4. Quality updates
   - Summary of quality audits and quality control processes performed
   - Listing of non-conformances and resolutions
   - Summary of Quality Manual updates
5. Public Information updates
   - Summary of public input received and responses
   - Summary of media contacts
   - Summary of complaints and resolution
6. Environmental compliance
   - Summary and copies of environmental monitoring reports
   - Summary of non-compliance issues and resolution
   - Summary of agency inspections
7. Utilities
   - Status of private utility work performed and required
   - Status of public utility work performed and required
8. Geotechnical
   - Summary of vibration and settlement monitoring activities and issues

- Copies of vibration monitoring reports
- Copies of settlement monitoring reports

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

### *2.2.3 Deliverables*

#### 2.2.3.1 Invoices

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

#### 2.2.3.2 Monthly Progress Reports

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

#### 2.2.3.3 Original Payment Breakdown

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

#### 2.2.3.4 Revised Payment Breakdown

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

#### 2.2.3.5 Design Breakdown Report

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

- The breakdown shall be provided in an electronic Excel spreadsheet.
- The breakdown shall list all major design activities. At a minimum, the breakdown should be broken down to a level of detail consistent with the Baseline CPM schedule.
- The breakdown shall list hours and rates per activity for each employee classification (e.g., Technicians, Senior Engineers, Project Managers, Administration).
- The breakdown shall list budgeted expenses per activity.
- The breakdown shall list a combined mark-up factor for overhead and profit.
- The spreadsheet shall sum the design activities, hours per activity, expenses, and overhead/profit mark-up into a single Lump Sum value equal to Form 9, Line 9 – Design Services.

## 2.3 Schedule Management

### *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 as-built activities from 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 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, furnish 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 include 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, durations, 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 2 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 2 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. 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.

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 the Department. Failure to include any element of required Work in any Schedule shall not relieve the Design-Builder from completing all Work necessary to complete the Project according to Completion Deadlines.

### 2.3.2.7 Schedule Updates

At a minimum, the Design-Builder shall submit an updated schedule, with a data date of the 21st day of the month or other date established by the Department that accurately records the dates Work started and completed. The schedule should be received as soon as possible after the applicable data date, but in no instance shall be later than four Calendar Days. 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 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, the reasons for any changes to Schedule or planned work. If in the opinion of the Department any proposed changes in planned work will 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. 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.

#### 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-Builder responsibility to meet with the 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 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 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 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 for the Design-Builder to submit a TIA addressing the impact will be considered prima facie evidence that the Department was not afforded the opportunity to mitigate the impact. At any time the Department may require the Design-Builder to demonstrate the impacts of any change, or proposed change, to the schedule via (TIA) and shall submit within seven Calendar Days of receiving the request, even if the Design-Builder believes that there is no impact to the schedule.

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

• An Impact Schedule

• Any associated cost burden or savings

• A narrative report developed specifically to demonstrate effects of deviations from the current working schedule to include:

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

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

### 2.3.2.13 Float Suppression / Sequestered Float / Use of Float

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

The Design-Builder acknowledges that all Float is a shared commodity available to the Project and is not for the exclusive benefit of any party, but is an expiring resource available to accommodate changes in the

Work, however originated. Contract time extensions for Contract performance will be granted only to the extent that delays or disruptions to effected work paths exceed total Float along those paths of the current Working schedule in effect at the time of delay or disruption. It is understood that identified contingencies, as described in the "Calendar and Identified Contingency" section, become available Total Float as time elapses and the contingency was not used.

### 2.3.2.14 Early Completion

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

### 2.3.2.15 Calendars and Identified Contingency

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

### 2.3.2.16 Non-Compliance

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

### 2.3.2.17 Level of Detail

The Schedule shall be 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 separate 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 and contain a verb

- Be a duration of not more than 20 Working Days nor less than 5 Days, unless otherwise authorized by the Department
- Have at least one predecessor and one successor activity, except for Project start and finish, respectively
- Express activity durations 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 (Segmental and or Precast elements)
- 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 rails 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 the Department, or third parties

- Potential problem areas
- Description and reason for any changes made to the schedule and the effects the changes have on Milestones or Project Completion Date

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
- Early Start, 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 the Department a Preliminary Schedule for Acceptance. Acceptance of the first Preliminary Schedule shall be a condition of NTP1.

#### 2.3.3.3 Baseline Schedule

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

#### 2.3.3.4 Schedule Updates

The Design-Builder shall submit an updated schedule, with a data date of the 21st day of the month or other date established by the Department that accurately records the dates Work started and 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.
- Defines the minimum standards and procedures for quality management.
- Assigns the responsibilities for specific quality management functions.

#### 2.4.1.3.2 Design Quality Management

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

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

#### 2.4.1.3.3 Construction Quality Management

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

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

- Involves the Department throughout the entire construction process.

#### 2.4.1.3.4 Continuous Improvement

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

#### 2.4.1.3.5 Flexibility

The description of the Quality Program in this Section 2.4 is not intended to be all encompassing, but to give the Design-Builder and the Department the flexibility to design and develop a program that best fits the needs of the Project and both parties.

### *2.4.2 Administrative Requirements*

#### 2.4.2.1 Standards

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

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

*Document modified for design-build.

#### 2.4.2.2 Quality Approach

##### 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 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 limited to, all systematic monitoring and evaluation of various aspects of the Project to ensure the standards of quality are being met, thereby providing confidence that all Work complies with the Contract and that all materials incorporated in the work, all equipment, and all elements of the Work will perform satisfactorily. The Design-Builder shall perform design quality check and review to ensure that the Work meet Contract requirements. The Design-Builder shall also perform construction quality testing and inspection activities to ensure that materials and the constructed Work meet Contract requirements. The quality tests and inspections shall be in accordance with the policies and

procedures defined in the Quality Manual. The Design-Builder's Quality Assurance team personnel shall be independent from and have no responsibilities in the production of the Work.

The Department's oversight role is to perform Independent Quality Assurance that includes reviews and audits of the design and construction products, and the Design-Builder's Quality Control and Quality Assurance activities. The Department will perform Independent Quality Assurance (IQA) activities that are an unbiased and independent audits and evaluation of all the technical checks, sampling, and 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's oversight reviews or problems during design or construction), the Department may, at its sole discretion, withhold payment for design and construction until sufficient quality procedures are in place. If construction is in progress, the Department may suspend ongoing Work represented by the deficient quality procedures and require correction of design and/or construction defects.

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

Subject to the Department's determination, the Department may assess the Design-Builder a $100-per-hour monetary deduction for failure to facilitate satisfactory progress or completion of the Work. Hourly charges may be applied to periods during which the Department determines the Design-Builder has not satisfactorily responded to a documented non-compliance. No charge will be assessed if the deficiency is corrected by the Design-Builder within one hour of written notification from the Department.

### 2.4.2.3 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.

#### 2.4.2.3.2 Quality Manual – Template

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

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

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

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

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

#### 2.4.2.3.3 Quality Manual – Responsibility

The Quality Manual shall

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

***Quality Manual Personnel/Staff***

The Design-Builder's Quality Manager shall:

- Be Approved by the Department.
- Have overall responsibility for the success of the Quality Program
- Have no responsibilities in the production of the Work.
- Verify and provide confidence that the Work meets or will meet the contractual requirements.

- Be the point of contact to resolve non-conformances and project quality issues with the Department.
- Report to the Design-Builder's executive management committee and be independent of the Design-Builder's Project Manager.
- Provide the Department's Contract Manager with all of 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.

The Design-Builder's quality staff shall not have the ability to deviate from Project requirements or to interpret Project specifications. Their role is solely to ensure the finished Work meets the requirements of the Contract. The Design-Builder's Quality 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 Structure 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, Department audit results, corrective actions taken, trends in nonconformance, and time to resolution.

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

### 2.4.2.3.4 Quality Manual - Design

***General***

All design (including design by Subcontractors) must meet the requirements of the Design-Builder's Quality Manual and the Contract Documents. Any non-standard designs, details, manuals, or documents other than those approved by the Department shall be submitted to the Department for approval prior to being used for design or the preparation of structure plans.

### *Design and Development Planning*

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

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

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

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

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

***Design Input***

The Quality Manual shall 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-licensed Professional Engineer with 15 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 a California-licensed Professional Engineer.

All Released for Construction Documents shall meet the following requirements:

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

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

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

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 Utility Owners are required, shop and working drawings shall be submitted to the applicable party for review and approval in accordance with their requirements.

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

Shop and working drawings and calculations for excavation shoring, cribs, cofferdams, falsework, MSE walls, overhead signs, temporary support systems, formwork, and other temporary Project elements that describe the methods of construction proposed to be used for the Project shall be prepared by the Design-Builder in accordance with their Quality Manual. 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 include other required materials specified in other Sections of Book 2. Additional requirements are as follows (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 and check 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 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 are part of the Department's Independent Quality Assurance (IQA) process and the 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 with the Contract requirements. These reviews will not routinely include detailed calculation or drawing reviews, although the Department retains the right to perform detailed reviews of any item at any time. If mutually agreed upon between the parties, for specific review items, the over-the-shoulder review may consist of an exchange of electronic files between the Design-Builder's designer and the Department.

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

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

In-Progress Design Workshops

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

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

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

- A list of the participants in attendance

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

Oversight Visits

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

Department Review Time Requirements

The Department will complete its review of the Design-Builder's plans and submittals based on the following review time requirements:

| | |
|---|---|
| QMP | 20 Working Days |
| Design Plans | 10 Working Days |
| Structure Plans (Segmental structures) | 15 Working Days |
| Structure Plans (Other structures) | 10 Working Days |
| Shop Plans | 10 Working Days |
| Released for Construction Submittal: | 12 Working Days |
| Other Reports/Plans | ** |
| Design Exceptions | 25 Working Days |
| RFI Submittal (Segmental Structures): | 10 Working Days |
| RFI Submittal (Others) | 4 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 the Department for review and comment. If the Department requests additional information during review of the re- submittal, the Design Quality Manager shall conduct an additional review of the resubmitted items.

Concurrent Submittals

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

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

| | |
|---|---|
| Design Plans | 2 |
| Structure Plans (Bridge) | 1 |
| Structure Plans (Others*) | 1 |
| Other Reports/Plans | 2 |

*Non-bridge structures: earth retaining walls, culverts, sign structures, walls, etc.

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 controlled through the provision of document control and be updated when new Subcontractor or Supplier contracts are implemented.
- Identify critical activity points at which Work shall be formally accepted by independent quality personnel and the Department prior to proceeding to the next stage of the Work. The Design-Builder shall provide Critical Activity Point Managers to ensure that all required tests and inspections have been performed leading up to critical activity points, and that the test and inspection results meet Contract requirements. The Design-Builder is encouraged to enhance this portion of the Construction Quality Inspection & Testing Plan from the Quality Manual Template.
- Describe verification of Suppliers' and Subcontractors' compliance with requirements.
- Depict the Quality Inspection (QI) critical activity points from the Materials Control Schedule and shall contain a written sign-off form for this activity.
- Be approved by the Quality Manager.

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

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

All material tests shall reference the activity ID.

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

***Materials Control Schedule***

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

The Design-Builder shall review the MCS for areas where inspection or testing is not addressed or the Design-Builder desires an increased rate of inspection or testing. The MCS has been reviewed and approved

by the Federal Highway Administration (FHWA), so any recommended changes by the Design-Builder will require Approval from the Department and possibly FHWA.

Both the Design-Builder and 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, in a timely manner. This will ensure the MCS requirements are being adhered to and, if shortcomings are found, improvements to the Inspection & Testing plan shall be made. The Design-Builder shall input and provide all testing and inspection records, including records from suppliers and subcontractors, electronically to the DCS. The Design-Builder's quality assurance team shall conduct quality assurance inspection that includes, but not limited to:

- Representative inspection of all quality control functions
- Periodic verification inspections of the materials, welding, and fabrication
- Periodic sampling and testing of materials
- Non-destructive testing (NDT) and verification inspection.
- Intermediate and final release inspections. Release inspections will be documented.
- 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 the Department. All management plans, such as the Quality Manual, Public Information Plan, Environmental Management Plan, Utility Plan, and Traffic Management Plan shall be individually bound. Each document that is transmitted to the Department shall be controlled by a unique document control number.

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

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

***Document and Data Approval and Issue***

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

***Document and Data Changes***

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

### 2.4.2.4 Department Role

#### 2.4.2.4.1 General

The Department will perform 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 in 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 testing and independent quality assurance sampling and testing. The Department will provide formal acceptance of Work at critical activity points. The Department will also perform Source Inspection.
- Management Program auditing will be performed on the implementation of the Design-Builder's management plans and Quality Manual. These audits will be systematic and independent examinations to determine whether quality activities and related results comply with planned quality

activities and expected results and whether they are implemented effectively and are suitable to achieve objectives.

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

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

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

#### 2.4.2.4.2 Access and Testing

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

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

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

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

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

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

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

### 2.4.2.5 Review and Disposition of Nonconforming Product

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

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

#### 2.4.2.6 Corrective and Preventative Action

##### 2.4.2.6.1 General

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

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

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

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

##### 2.4.2.6.2 Corrective and Preventive Action

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

#### 2.4.2.7 Internal Quality Audits

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

#### 2.4.2.8 Software

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

### *2.4.3 Deliverables*

#### 2.4.3.1 Final Quality Manual

##### 2.4.3.1.1 Submittal and Approval

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

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

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

#### 2.4.3.1.2 Track Changes

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

#### 2.4.3.1.3 Ownership

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

### 2.4.3.2 Design Submittals and Released For Construction Documents

- The Design-Builder shall submit to the Department two hardcopies of all Design submittals for review and two hardcopies of all Released for Construction Documents for acceptance. The Design-Builder shall create electronic PDF versions of all hardcopies and upload them into DCS. The contents shall adhere to Section 2.4.2.3.5.

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). The Department will advise the Design-Builder of the status of their Acceptance of the As-Built Documents within 30 Working Days of receipt of same. Formal written Acceptance of the As-Built Documents must be granted by the Department before finalization of the Contract. Upon Acceptance, the Design-Builder shall upload electronic versions of all As-Built Documents, in native and PDF format into DCS.

### 2.4.3.5 Product Data

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

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

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

# 2.5 Human Resource Management

## *2.5.1 General*

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

## *2.5.2 Administrative Requirements*

### 2.5.2.1 General

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

### 2.5.2.2 Key Personnel

#### 2.5.2.2.1 General

Key Personnel for the Project shall include the following:

- Design-Builder's Project Manager
- Quality Manager
- Construction Manager
- Design Manager
- Design Lead Engineer- Roadway
- Design Lead Engineer- Structures
- Right of Way, Utilities, and Permitting Coordinator
- Geotechnical Engineer
- Safety Manager
- Project Scheduler
- Visual Quality Manager
- Design Quality Assurance Manager
- Construction Quality Manager
- Environmental Compliance Manager
- Traffic Engineer
- Traffic Control Supervisor
- Survey Manager
- Hydraulics Engineer
- Public Information Coordinator
- Storm Water Pollution Prevention Manager
- Hazardous Materials Manager
- Electrical Engineer

#### 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. Key Personnel will be evaluated, in part, based on the extent they meet and/or exceed such requirements. All Key Personnel will be required to be available to the Project Site during activities that involve their areas of responsibility.

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 at least fifteen years experience managing complex infrastructure projects, ten years experience managing the design and construction of major urban freeway projects, five years project management experience in design-build on major urban freeway projects, and recent experience as Project Manager for design and construction of highway projects similar in scope and complexity
- License as Professional Engineer in California is preferred, but not required.

**Quality Manager**

- Shall have overall responsibility for overseeing the Quality Management of design, construction, and Project management activities, including authority and responsibility for all Quality Management resources.
- Quality Manager can act as either the Construction Quality Manager or the Design Quality Manager.
- 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 at least fifteen years of experience managing complex infrastructure projects, five years of major design-build construction management of major urban freeways, and recent experience in quality management of design and construction of projects similar in scope and complexity on projects.

- License as Professional Engineer in California is preferred, but not required

***Construction Manager***

- Shall be responsible for ensuring that the project is constructed in accordance with the design and project requirements
- The Design Quality Assurance Manager and Construction Manager shall be different people.
- Shall report directly to the Design-Builder's Quality Manager.
- 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 have the authority to stop any and all Work that does not meet the Contract requirements.
- License as Professional Engineer in California is preferred, but not required
- Shall have at least fifteen years of experience managing complex infrastructure projects, ten years of experience in managing the construction of major urban freeways, and five years of major design-build construction management of major urban freeway

***Design Manager***

- Shall be responsible for coordinating the design of the individual design disciplines and for ensuring that the overall Project design is completed and design criteria requirements are met. The Design Manager must be available to the Department within 24 hours whenever design activities are being performed, including design activities related to field design changes.
- Shall be on-site full time until the design is 100% complete and as required during the construction phase of the Project.
- Shall be assigned full time and 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 fifteen years of experience managing complex infrastructure projects, ten years of experience in managing the design of major urban freeways, and five years or preferred 10 years of. recent experience managing the design of highway projects similar in scope and complexity, and five years of major design-build project management experience of major urban freeway

***Design Lead Engineer- Roadway***

- Shall report to the Design Manager and shall be responsible for ensuring that the overall roadway design is completed and design criteria requirements are met.
- Shall be a licensed Professional Engineer in the State of California now or by the time the first Notice to Proceed is issued and shall be designated as the Engineer of Record for the roadway design..
- Must be present at all review and design coordination meetings
- Shall have at least ten years of recent experience as Engineer of Record and in design of roadway on the California State Highway System, ten years of recent experience in the design of roadways in major urban freeway systems similar in scope and complexity.

***Design Lead Engineer- Structures***

- Shall report to the Design Manager and shall be responsible for ensuring that the overall structures design is completed and design criteria requirements are met.
- Shall be a licensed Professional Engineer in the State of California now or by the time the first Notice to Proceed is issued.
- Shall be designated as the Engineer of Record for the structure design and must be present at all review and design coordination meetings.
- Shall have at least ten years experience in the design of new long-span bridges structures similar in scope and complexity, ten years experience in the design of large complex bridge structures – segmental bridges and/or steel bridges, and ten years experience in the design of bridge structures on the California State Highway System.

***Right of Way, Utilities, and Permitting Coordinator***

- Shall be responsible for coordination of right of way, utility, and permitting requirements of the Design-Builder and for ensuring that right of way, utility, and permitting issues are resolved prior to construction.
- Shall be assigned to the project full time and will be required to be on-site for the duration of the project.
- Shall report to the Project Manager.

- Shall have at least ten years of experience with complex infrastructure projects with direct management of right of way functions and five years of management of right of way functions on major urban freeways

***Geotechnical Engineer***

- Shall report directly to the Design Manager and shall be responsible for geotechnical investigations and reports.Shall have experience in the design and construction of the following Project elements, at a minimum: Bridge structures and foundations of the magnitude and type to be used, site-specific seismic conditions, soil and structure interaction, and site-specific soil properties .
- Shall have at least fifteen years of recent experience in deep foundation design including large pipe piles, drilled shafts, monitoring drilled shaft construction, drilled shaft load testing criteria analysis, spread footings, settlement, and in matters relating to geotechnical subsurface exploration; geotechnical analysis; design; and construction of bridge foundations and retaining walls.
- Shall be a licensed Professional Engineer (with both Civil and Geotechnical Engineer Licenses) licensed in the State of California now or by the time the first Notice to Proceed is issued.

***Safety Manager***

- Must not be under the direct supervision of construction personnel and will report directly to Design-Builder's Project Manager.
- Shall be on Site weekly and available to the Site for the duration of the Project.
- Shall have the authority to stop any and all Work when unsafe conditions are present.Shall have at least fifteen years experience managing complex infrastructure projects, five years of major construction management of major urban freeways, and ten years experience working with roadway work zone safety and OSHA regulation.
- Must be familiar with FHWA work zone training requirements and work zone safety regulations and must have at least ten years of recent experience working in roadway work zone safety and OSHA regulations.

***Project Scheduler***

- Must works directly for the Design-Builder
- Shall be assigned to the Project full time and will be required to be on-site for the duration of Project
- Shall have fifteen years experience in scheduling complex infrastructure projects and five years experience of major design-build construction schedule management on major urban freeways.

**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 $20,000.

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

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

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

The Design-Builder shall establish a main Integrated Project Office (IPO) within four weeks of NTP1 to manage, coordinate, and administer design, construction and maintenance of the Project in accordance with the Contract. This facility shall also provide space for the Department personnel. All personnel shall be co-located in this facility within four weeks of NTP1, except as otherwise allowed.

The Design-Builder shall furnish all office facilities in accordance with this Section 2.5.2.3. The facilities shall remain the property of the Design-Builder. The Design-Builder shall furnish, maintain, and service the facilities with fuel, electrical power, sanitary services, access roads, and other necessary items including ADA requirements. The Design-Builder shall provide the following with the office space:

- All utility installation, maintenance and costs
- Daily janitorial services including providing trash and recycling containers and pickup service
- Exterior building maintenance, including the parking lot
- Removal of all Design-Builder-provided facilities
- Site identification signing at all offices and sites of Work
- Telephone installation, phone service charges, and the removal of the system

- Building access control by receptionist or key card entry

#### 2.5.2.3.2 Location

The Integrated Project Office for the design phase of the Project shall be located no more than five miles from the Project Site.

#### 2.5.2.3.3 Facilities and Space Requirements – Project Office

The Design-Builder shall provide office staff facilities for all Design-Builder key personnel and Department oversight and designated personnel in the same building.

The Design-Builder shall provide and supply the office space and equipment specified in this Section 2.5.2.3 from four weeks after NTP1 until Final Acceptance. The Design-Builder shall provide offices and equipment for the Department that is in good condition and of at least the same quality as the facilities that the Design-Builder provides its personnel on the Project.

***General Office Requirements***

The Design-Builder shall provide office space for the Department personnel not less than the size indicated below:

| Space | No. Required | Requirement |
|---|---|---|
| Office | 5 | 150 square feet each, enclosed with lockable door, 48-inch round table with four chairs, additional bookcase, and computer desk |
| Office | 2 | 100 square feet each, enclosed, may be modular spaces |
| Conference room | 1 | 300 square feet each, enclosed with lockable door<br>Additional furnishings in each conference room: conference table and chairs to accommodate 15 people; 4-foot by 8-foot white board. |
| Storage/Filing | 2 | 150 square feet, enclosed with lockable door<br>Additional furnishings in each storage/filing room: eight four-drawer file cabinets and two 11-inch by 17-inch file cabinets with four drawers. |
| Restrooms | 1 each | Men's and women's |
| Free Paved parking | | 1 space per office plus 2 visitor spaces |
| Break room | 1 | 250 square feet, 8 feet of counter space with sink, drinkable running water, 1100-watt microwave, refrigerator (19 cubic foot minimum), range/oven, and break room supplies |

For the facilities provided, the Design-Builder shall:

- Provide a desk and chair, two-drawer filing cabinet, bookcase, 3-foot by 4-foot white board, two guest chairs, and waste basket for each office space.

- Provide meeting facilities for all Project related meetings. In the event the requirements for any meeting exceed the space available in the co-location office, the Design-Builder shall provide space at another location.
- Provide heating, ventilation, and air conditioning capable of maintaining temperature between 68 and 72 degrees Fahrenheit in all spaces throughout the year.
- Provide facilities that meet local code requirements for office space.
- Provide telephones and telephone service with at least 5 outside lines, plus at least 1 line dedicated to fax service. A minimum of one telephone shall be provided in each office, 1 additional telephone shall be provided and located strategically for shared use in other areas of the Project office, and 1 conference star telephone shall be provided and located in the conference room. The phone service shall provide voice mail service to each extension.
- One T1 line for high speed internet access.
- Provide a contract for the co-housed facility to the Department one week after the execution of the Contract.

#### 2.5.2.3.4 Facilities and Space Requirements – Field Office and Laboratory

The Design-Builder shall provide a Field Office and one Field Laboratory. These shall be separate facilities and shall be in accordance with Standard Specification, Section 2031, Type D and the following:

- The Field Laboratory shall be a minimum of 150 square feet and include a lock box.
- The Design-Builder shall provide an exterior storage facility adjacent to the office structure that is a minimum of 100 square feet. The facility shall be for the exclusive use of the Department to store its testing equipment and testing supplies. This facility must be lockable, accessible by vehicles via an all-weather surface and must be substantially constructed as necessary to meet all requirements for storing nuclear test devices.
- The Design-Builder shall provide free parking to all Department personnel.
- The Field Office shall be a minimum of 500 square feet and include the following, at a minimum:
  - One desk calculator having a minimum of 10 digits for print/display.
  - One lock box.
  - Fax machine that includes a 30-page auto document feeder, transmission speed of 15 seconds per page, a minimum of 10 pages of memory, and a telephone hand set with fax/phone switching.
  - The phone service shall also include a digital, time stamp telephone answering machine and caller I.D. service, and two telephones with service.
  - One T1 line for high speed internet access, plus two additional phone lines with two conference-calling phones on each line.
  - One dry tone copy machine capable of reproducing 8.5-inch by 11-inch and 11-inch by 17-inch sheets of paper with an automatic paper feed. The Design-Builder shall provide for a contract maintenance agreement of the copy machine for the life of the Contract. The copier shall be capable of 10 pages per minute output minimum with a document feeder capable of 99 pages or greater.
  - Two office tables 30 inches by 60 inches with adequate supply of chairs for all participants at Project meetings.
  - One hot and cold water dispenser complete with cups and drinkable water supply always on hand.
  - One full size refrigerator/freezer.
  - One 1100-watt microwave oven.
  - One first aid kit.

- One waterless hand cleaning dispenser in portable toilet.

### 2.5.2.3.5 Computer Equipment

The Design-Builder shall provide, install, and maintain, in working condition, the following communications and computer equipment for the Department use at the Project Office during the life of the Project:

- 3 non-CADD laptop computers
- 2 desktop non-CADD computers
- 4 desktop CADD computers
- One full-size plotter
- One laser printer capable of both color and black and white printing
- One multi-function scanner/copier/fax machine
- Video-teleconference equipment (1 TV and accessories)

The Design-Builder shall provide, install, and maintain the following computer equipment for use at the Field Laboratory:

- two portable laptop computers for field personnel equipped with cellular aircards for high speed wireless internet access
- One laser printer. At the Design-Builder's discretion, the laser printer, copy machine, and fax machine at the Field Laboratory may be combined into one multi-function machine meeting the requirements of each individual piece of equipment as described herein.

***Non-CADD Computers***

Desktop (non-CADD) computers shall meet the following requirements, subject to final Approval by the Department:

- Small Form Factor or Desktop computer case
- Minimum 3.0-gigahertz (GHz) Intel Core2Duo Processor (E8400)
- Minimum 4-gigabyte (GB) DDR2 random-access memory (RAM), 800-megahertz (MHz) speed, with two open slots
- Minimum 80-gigabyte (GB) SATA internal hard disk drive, 7200 RPM
- One optical combo drive with compact disk with read/write (CD-RW) capability and read only digital versatile disc (DVD-ROM) capability
- Two LCD-22-inch (diagonal measure) color monitors
  - minimum resolution 1280x1024
  - minimum brightness 250 Nits
  - minimum contrast ratio 500 to 1
  - minimum response time 8 ms
  - pixel policy ISO-13406-2 compliant
  - VGA/DVI interface options
  - VESA mounting hole pattern compliant
  - adjustable height monitor stand
- Integrated sound
- PCI Express x-16, 256 MB discrete dual video
- Integrated 10/100/1000 Ethernet network capability

- One parallel and one serial port
- Four USB 2.0 ports on the back, 2 on the front
- One USB optical mouse
- One USB standard 104-key keyboard
- Office 2007 or above and O/S, and Adobe Pro(write)

***CADD Computers***

Desktop (CADD) computers shall meet the following requirements, subject to final Approval by the Department:

- Small Form Factor, Desktop or Tower computer case
- Minimum 3.16-gigahertz (GHz) Intel Core2Duo Processor (E8500)
- Minimum 4-gigabyte (GB) DDR2 random-access memory (RAM), 800-megahertz (MHz) speed, with two open slots
- Minimum 160-gigabyte (GB) SATA internal hard disk drive, 7200 RPM
- One optical combo drive with compact disk with read/write (CD-RW) capability and read only digital versatile disc (DVD-ROM) capability
- Three LCD-22-inch (diagonal measure) color monitors

- minimum resolution 1280x1024
- minimum brightness 250 Nits
- minimum contrast ratio 500 to 1
- minimum response time 12 ms
- pixel policy ISO-13406-2 compliant
- VGA/DVI interface options
- VESA mounting hole pattern compliant
- adjustable height monitor stand

- Integrated sound
- PCI Express x-16, 256 MB discrete dual video
- Integrated 10/100/1000 Ethernet network capability
- One parallel and one serial port
- Four USB 2.0 ports on the back, 2 on the front
- One USB optical mouse
- One USB standard 104-key keyboard
- Office 2007 or above and O/S, and Adobe Pro(write)
- Docking station for Laptops

***Laptop Computers***

Laptop computers shall meet the following requirements, subject to final Approval by the Department:

- Minimum 2.26-gigahertz (GHz) Intel Core2Duo Processor (P8400)
- Minimum 4-gigabyte (GB) DDR2 random-access memory (SDRAM), 800-megahertz (MHz) speed, with one open slot
- Minimum 80-gigabyte (GB) SATA internal hard disk drive, 7200 RPM

- One modular optical combo drive with compact disk with read/write (CD-RW) capability and read only digital versatile disc (DVD-ROM) capability
- Minimum 128-megabyte (MB) discrete graphics
- Minimum 14 inch WXGA TFT active matrix display
- Integrated sound and stereo speakers, headphone/speaker jack, line-in and microphone jacks
- Integrated 10/100/1000 Ethernet network capability
- Integrated 802.11 a/g/n wireless networking
- Integrated V.92 56K modem
- One Type II PC card slot
- Minimum two USB 2.0 ports
- Two rechargeable lithium Ion (LiOn) battery packs, each with a minimum battery life of two hours
- One AC/Car/Air power adapter
- Energy Star compliant per v4.0 Tier 1 standard
- EPEAT silver level
- One padded laptop carrying case suitable for carrying proposed laptop and accessories
- One port replicator including VGA, parallel, serial and PS/2 ports
- One LCD- 19-inch (diagonal measure) color monitor

- minimum resolution 1280x1024
- minimum brightness 250 Nits
- minimum contrast ratio 500 to 1
- minimum response time 12 ms
- pixel policy ISO-13406-2 compliant
- VGA/DVI interface options
- VESA mounting hole pattern compliant
- adjustable height monitor stand

- Compatible docking station with full-size USB keyboard and optical mouse
- Minimum 3 years extended warranty

***Computer Accessories***

The Design-Builder shall furnish the following accessories for each computer, printer, plotter:

- One electrical surge protector

***Plotter***

Plotters shall meet the following requirements, subject to final Approval by the Department:

- Black-and-white, and color capable
- Ink types: dye-based colors and pigment-based black
- Media Handling:

- manual sheet feed and manual roll feed
- automatic paper cutter
- plain paper, inkjet paper, coated paper, heavy coated paper, glossy paper and photo paper compatible
- paper sizes of B, C, D, E and roll media up to 42 inches wide and 300 feet long

- Memory: minimum 1GB
- Color/resolution: black, cyan, magenta, and yellow toner cartridges, with a minimum of 600 x 600 dpi color output
- One compatible printer cable
- 10/100 Ethernet connection
- Minimum 3 years extended warranty

The pre-approved plotter is HP Designjet 4000ps (Q1274A).

***Printer***

Printers shall meet the following requirements, subject to final Approval by the Department:

- Laser printing technology; capable of black and white at the Field Laboratory, and capable of black and white and color at the Project Office
- Minimum speed of 22 pages per minute
- Minimum resolution of 600 x 600 dpi for black-and-white or color
- Memory: minimum 1GB
- Duplex printing capable
- One compatible printer cable
- One spare toner cartridge for each color (in main Project Office at all times)
- 10/100 Ethernet network connection
- Media sizes: letter, legal, executive, 11 x 17 inch, envelopes (No 10, Monarch)
- Paper size capacity: two letter/legal paper trays (one large volume) at portrait and/or landscape orientation, and one 11-inch x 17-inch capable paper tray
- Paper capacity: minimum of 500-sheet paper feed tray
- Compatible with operating systems: Windows XP Professional and Windows Server 2007
- Minimum 3 years extended warranty

***Scanner/Copier/Fax***

Multi-function scan/copy/fax machines shall meet the following requirements, subject to final Approval by the Department:

- Minimum scanning/copying/fax area: 11 x 17 inches
- Resolution capability up to: 1200 x 1200 dpi
- Output black-and-white and color speed capability up to 50ppm
- 100-sheet minimum - automatic reversing document feeder that enables batch scanning and copying of large documents
- Automatic document size recognition
- Duplex capable
- Media sizes: letter, legal, executive, 11 x 17 inch
- Paper Trays:
  - 2 x 250 sheet drawers (one adjustable to 11 x 17 inch)
  - 1 x large capacity drawer
  - 1 x 100 sheet bypass

- 10/100 Ethernet network connection

***Video-Teleconference Equipment and Accessories***

- 1 TV with video-teleconference capabilities
- 1 Star phone for multi-party teleconferencing
- 1 Codec Box HDX 8000 or HDX 9002 using H323 (IP) protocol
- 1 Camera with video teleconference

The codec box should have content sharing (H239) capability for power point presentation.

### 2.5.2.3.6 Computer Networking – Project Office

The Design-Builder shall provide the following for exclusive use by the Department personnel for the duration of the Contract including periods of work suspension.

The Design-Builder shall furnish and maintain all computer network equipment for the Department use. The furnished services, equipment, and accessories shall at a minimum be as follows:

***Broadband Services Technical Requirements***

The Design-Builder shall provide the Department with the information required by the Internet Service Provider (ISP) to authorize communication between the ISP and the Department technical staff for purposes of problem resolution. This information shall include the name of the provider, a phone number for technical support and the account number as a minimum. The Design-Builder shall determine if additional information will be required from the ISP. This information shall be in writing and shall be provided to the Department within five weeks after notice of Contract Approval.

The Design-Builder shall provide the following service:

- Minimum bandwidth size shall be 10 Mbps
- Terminating in an Ethernet connection
- Static Public IP Address – For Internet Use
- Static Public IP server - For Video-conference only
  - (Minimum of three assignable host addresses, one for the remote VPN firewall, one for the ISP Gateway)
- Required IP addressing information provided to the Department for remote VPN firewall Configuration:
  - IP address (Static Assignable Host Range)
  - ISP Gateway Address
  - Subnet Mask
- ISP Modem Hardware – Firewall configuration settings must be manageable, allowing for the firewall security level to be set to "off".

***Networking Equipment***

Wireless access shall be available throughout the office area. The Design-Builder shall provide the following equipment:

- 24u Network Rack (separate and lockable)
- Cat 5e ethernet wiring
- Cat 5e Patch panels to accommodate 48 connections
- Cisco Catalyst 3750 switch to accommodate 48 connections

- Wireless Hardware:
- Cisco Access Point:
- AIR-AP1252AG-A-K9 - 802.11a/g/n- 2.4/5-GHz Mod Auto AP; 6 RP-TNC
- Access Point Antennas:
- AIR-ANT2422DG-R - Three 2.4-GHz 2.2 dBi Gray Straight Dipole Ant RP-TNC
- AIR-ANT5135DG-R - Three 5-GHz 3.5 dBi Gray Straight Dipole Ant RP-TNC
- Access Point Power Supply:
- AIR-PWRINJ4 - Power Injector for the Cisco Aironet 1250 Series
- Cisco VPN Firewall:
- ASA 5505 Appliance with SW, 50 Users, 8 ports, 3DES/AES
- ASA5505-50-BUN-K9

The Design-Builder shall provide any additional hardware necessary to ensure the network functions as intended.

### 2.5.2.3.7 Computer Networking – Field Laboratory

The Design-Builder shall provide the following for exclusive use by the Department personnel for the duration of the Contract including periods of work suspension.

The Design-Builder shall furnish and maintain all computer network equipment for the Department use. The furnished services, equipment, and accessories shall at a minimum be as follows:

***Broadband Services Technical Requirements***

The Design-Builder shall provide the Department with the information required by the Internet Service Provider (ISP) to authorize communication between the ISP and the Department technical staff for purposes of problem resolution. This information shall include the name of the provider, a phone number for technical support and the account number as a minimum. The Design-Builder shall determine if additional information will be required from the ISP. This information shall be in writing and shall be provided to the Department within five weeks after notice of Contract Approval.

The Design-Builder shall provide bandwidth in the order of precedence shown below with criterion 1 being the requirement, followed by criterion 2 as the next desirable:

1. Minimum bandwidth shall be 10 Mbps
2. Minimum bandwidth shall be a T1 line

The Design-Builder shall provide the following for either the 10 Mbps connection or T1 Line:

- Terminating in an Ethernet connection
- Static Public IP Address – For Internet Use
- (Minimum of two assignable host addresses, one for the remote VPN firewall, one for the ISP Gateway)
- Required IP addressing information provided to the Department for remote VPN firewall Configuration:
- IP address (Static Assignable Host Range)
- ISP Gateway Address
- Subnet Mask

- ISP Modem Hardware – Firewall configuration settings must be manageable, allowing for the firewall security level to be set to "off".

***Networking Equipment***

Wireless access needs to be available throughout the office area. The Design-Builder shall provide the following equipment:

- Cat 5e ethernet wiring
- Cisco Catalyst 3750 switch to accommodate 24 connections
- Wireless Hardware:

– Cisco Access Point:
– AIR-AP1252AG-A-K9 - 802.11a/g/n- 2.4/5-GHz Mod Auto AP; 6 RP-TNC
– Access Point Antennas:
– AIR-ANT2422DG-R - Three 2.4-GHz 2.2 dBi Gray Straight Dipole Ant RP-TNC
– AIR-ANT5135DG-R - Three 5-GHz 3.5 dBi Gray Straight Dipole Ant RP-TNC
– Access Point Power Supply:
– AIR-PWRINJ4 - Power Injector for the Cisco Aironet 1250 Series

- Cisco VPN Firewall:

– ASA 5505 Appliance with SW, 50 Users, 8 ports, 3DES/AES
– ASA5505-50-BUN-K9

The Design-Builder shall provide any additional hardware necessary to ensure the network functions as intended.

#### 2.5.2.3.8 Delivery and Installation

The Design-Builder shall deliver all computer equipment to the Project Office within four weeks after NTP1. The Design-Builder shall install the cat 5e ethernet wiring to all networkable devices – including but not limited to servers, office computers, printers, scanners, and wireless access points. The Design-Builder shall be responsible for installation of all computer equipment, including connecting the computer equipment to the necessary communication network at the Project Office. Department will sanitize and image the computers provided by the Design-Builder.

The Design-Builder shall deliver all networking equipment to the Department. The Department will sanitize and image the network equipment. The Department will install the network equipment at the Project Office and Field Laboratory. The Design-Builder shall provide space for the network equipment at the Project Office and Field Laboratory.

The Design-Builder shall have all computer equipment fully functioning within five weeks after NTP1. The Design-Builder shall contact the Department two weeks prior to the computers being fully installed and ready to be imaged**.**

#### 2.5.2.3.9 Replacement and Repair

If office equipment is stolen or damaged beyond repair, the Design-Builder shall provide an equivalent replacement within three Working Days. If the equipment needs repair, the Design-Builder shall repair it within three Working Days. Such replacement or repair shall be at no direct cost to the Department during the life of the Project.

#### 2.5.2.3.10 Return of Equipment

The Department will sanitize and return the computer and networking equipment to the Design-Builder within 90 Days after Final Acceptance of the Project.

### *2.5.3 Deliverables*

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

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

## 2.6 Safety Management

### *2.6.1 General*

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

### *2.6.2 Administrative Requirements*

#### 2.6.2.1 Design-Builder Safety Management Plan

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

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

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

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

11. Describe incident reporting procedures.
12. Describe the Design-Builder's Work Site control policy and plans for maintaining Site cleanup, on-Site first aid facilities or medical clinic, and safe access.
13. Identify public safety requirements (e.g., fencing, signs, 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, reduction of risk, logs, and mapping procedures.
18. Describe the Design-Builder's management and auditing of the Safety Management Plan.
19. Describe personal protective equipment (PPE) requirements and policy.
20. Describe safety procedures for Design-Builder's employees working around and handling contaminated materials.

### *2.6.3 [NOT USED]*

### 2.6.4 Construction Requirements

#### 2.6.4.1 Working Conditions

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

### *2.6.5 Deliverables*

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

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

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

# EXHIBIT 2-A

Quality Manual Template

This exhibit is provided as an electronic file.

# 3 PUBLIC INFORMATION

## 3.1 General

The Design-Builder shall perform all Work necessary to meet the requirements associated with public information in accordance with the requirements of the contract documents and these Technical Provisions. This shall include assigning a Public Information Liaison (PIL), collecting data and providing it to the Department, and all other requirements specified herein.

## 3.2 Administrative Requirements

Public information goals for the Project shall be consistent with the Department Strategic Plan (See Book 3, Applicable Standards). These goals include establishing general public awareness and understanding; building respectful, productive, and mutually beneficial relationships with the community, customers, tenants, and vendors; and engaging the community, international trade industry, elected officials, and government agencies to build positive relationships that foster mutual understanding.

### *3.2.1 Standards*

| Author or Agency | Title |
|---|---|
| 1. Department | Project Communication Handbook |

### *3.2.2 Staff*

The Design-Builder shall provide a full-time Public Information Liaison (PIL) who shall be the conduit for information dissemination and the point of contact for all public information queries from Department. The PIL shall maintain a system to ensure a flow of information from the Design-Builder to Department.

The PIL shall be accessible 24 hours a Day, seven Days a week, and shall respond within two hours of contact to address Project issues. The PIL shall provide contact information, including home, fax, mobile, and pager numbers, to Department.

The PIL and the Department shall meet weekly (or as deemed necessary by the Department) and shall communicate regularly by phone and e-mail.

The PIL, to be Approved by the Department and available for Project duties within 30 Days of NTP1, shall possess the following qualifications:

- Bachelor's degree or equivalent in communications, public relations, journalism, or related field
- Minimum of 3 years experience with increasing responsibility in implementing communications/public outreach plans for large public works/capital improvement projects
- Knowledge of communications challenges inherent in major capital improvement projects
- Knowledge of emerging trends in the field of communications, including use of new technologies
- Knowledge of the principles of public administration, public information, and intergovernmental relations
- Experience in serving as a spokesperson for large scale public works projects

### *3.2.3 Public Information Plan*

At a minimum, Department requires its communications efforts for this (and every) Project to establish and build trust between 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 Department and the Design-Builder. These are messages that communicate the following:

- The **Vision** of the Project – answers to questions such as why the Project is needed, what Work will be done, how the Project will benefit customers, how the Project fits into the community, and how the Project fits into the State's broader transportation plans.

- The Project's **Progress** – ongoing messages to keep people informed about how the Project is moving forward, whether it's on schedule and on budget, what disruptions or improvements are coming in the near future, and what beneficial innovations are being used.
- **Coping** during the Project – information that helps people deal with inconveniences caused by the Project, such as details about detours, blocked driveways, traffic restoration projects, and, construction and noise impacts on local residents and businesses. This shall include describing informational resources available to the public.

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

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

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

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

### *3.2.4 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
- Local property owners
- Commuters
- Motorists in the general Project vicinity
- Commercial vehicle operators
- Department employees, clients, and consultants
- Local, regional, and state government agencies
- Los Angeles Area Chamber of Commerce
- City, County, and State elected officials
- School district transportation agencies/charter companies
- Local business owners, employees, and customers

- Neighborhood and business associations
- News media, as pertinent
- Emergency response organizations, including the California Highway Patrol, police, fire, and ambulance agencies
- Los Angeles County Sheriff
- Utilities
- Local community organizations
- Local delivery and courier services
- School districts
- Water management organizations, environmental permitting agencies, and other local service districts

### *3.2.5 Crisis Communications*

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

- Designated staff to respond to the emergency
- Types of potential emergencies
- Formulating approaches to address specific emergencies
- Identifying cause of specific disruptions (i.e., whether construction-related or not)
- Providing information on:
  - Actions being taken to alleviate the problem
  - Impact to the public and notification procedures
  - Anticipated duration of the disruption

### *3.2.6 Data Collection and Management*

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

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

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

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

### 3.2.6.1 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 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 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 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 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 3.2.8.1.1.
- The Design-Builder shall coordinate the dissemination of information (construction, commercial vehicle, incident, etc.) with Department, other agencies, and relevant customers (e.g., the media) throughout the Project.
- The Design-Builder shall be responsible for the accuracy and reliability of the information provided.

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

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

- All planned construction activities shall be recorded no later than 30 Days before planned start date and shall include possible construction noise impacts.
- Construction information updates/changes shall be recorded within 24 hours of the information being made available to 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 Department of changes, post the information on the Web site, and disseminate it through other technologies.

- All information shall be verified for accuracy before release.

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

The Design-Builder shall record, maintain, and make the 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.

#### 3.2.6.1.1. Construction Schedule

Construction notification shall be made available to 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.

- Description of the activity
- Start of the activity
- End of the activity

The PIL 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.

#### 3.2.6.1.2 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
- Start time and duration of changes
- Alternate routes and detours
- A contact for further information

#### 3.2.6.1.3 Traffic Conditions

The PIL shall inform the Department of any unusual traffic conditions, such as road obstructions, and likely duration within 15 minutes of detection.

#### 3.2.6.1.4 Commercial Vehicle Access and Restriction Information

Ten Days prior to any 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 PIL shall provide the

California Highway Patrol, Department's District 7, Department's Office of Truck Services (Transportation Permits), and Department's Project Manager with notice including:

- Description of the event
- Start of the event
- End of the event

#### 3.2.6.1.5 Emergency Services Vehicle Access

The PIL 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. The Design-Builder shall provide this schedule to Department within 40 Days of NTP1 for inclusion in the Public Information Plan (PIP).

#### 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 Department information regarding changes in access.

#### 3.2.6.1.7 Bicycle, Pedestrian, Handicapped Mobility, and Access

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

#### 3.2.6.1.8 Utility Shut-Offs

The PIL shall provide start time and duration of Utility shut-offs early enough so the Department may provide written notice to the affected parties at least 48 hours in advance of any outages.

The PIL shall be responsible for keeping the emergency Utility contact list updated on at least a quarterly basis.

#### 3.2.6.1.9 Incident Information

The Design-Builder shall be responsible for disseminating incident information to the appropriate parties. This 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 PIL or designate shall report them to Department within 15 minutes of detection.

#### 3.2.6.1.10 Nighttime Construction Noise

The PIL shall continually inform the Department of planned and potential nighttime construction noise impacts to enable the Department to notify affected residents in writing at least seven Days in advance. The PIL shall communicate to the Department any changes in planned noise impacts early enough that residents may be notified one Day in advance.

### *3.2.7 Methods of Disseminating Information*

The PIL shall assist the Department by providing information in a variety of formats, as requested by the Department, and being available to meet in person with stakeholders or audience members, as requested by the Department

#### 3.2.7.1 Public Contact

The Department will be the primary contact with all members of the public, with the PIL available to assist, as needed. The Department will work closely with Design-Builder to facilitate coordinated and consistent efforts when contacting and disseminating information to the public.

#### 3.2.7.2 Telephone Hotline

The Design-Builder, in developing design and conducting its construction activities, shall be responsive to comments and concerns received on this hotline. After receiving hotline comments from Department, the PIL shall route pertinent comments to the appropriate Design-Build staff, including Project Manager.

#### 3.2.7.3 Media Relations

The Design-Builder, generally via the PIL, shall immediately notify Department of any situations involving the media and shall refer all media inquiries to Department.

The PIL and at least one executive member of the Design-Builder's engineering team shall participate in media training through the Department, and shall be familiar with the Department Media Relations Policy. At least one of the Design-Builder's licensed engineers who have attended media training shall be available throughout design and construction to serve as a Project spokesperson.

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

#### 3.2.7.4 Government Affairs

The PIL shall participate in meetings with elected officials and staff as requested.

#### 3.2.7.5 Project Identity

The Design-Builder shall support the Department efforts to build awareness of the Project by employing Project identity or "brand" elements (developed and provided by the Department), along with Department logo and Project name, in any of its own communications about the Project.

### *3.2.8 Tools for Disseminating Information*

In addition to its own solutions for communicating with Department, as Approved by Department, the Design-Builder shall use the following tools for disseminating information.

#### 3.2.8.1 Electronic Information Dissemination

##### 3.2.8.1.1 Web Site

The PIL shall provide to the Department, at a minimum, construction information, commercial vehicle restrictions, regular input for a community/construction calendar of events, frequently asked questions (with accompanying answers), and other relevant information to be posted by the Department on Web (http://www.dot.ca.gov/dist07/travel/projects/10-605-Interchange). The PIL shall provide the Department with updates daily, or more frequently, as needed.

##### 3.2.8.1.2 Video Cameras

The Design Builder shall provide, install, and maintain up to 10 video cameras on the construction site, with number of cameras and specific locations directed by the Department. Each camera shall provide a live feed transmitted to a Department server.

##### 3.2.8.1.3 Portable Changeable Message Signs

Above and beyond temporary signs indicating lane closings and other safety information, as specified in Section 16, the Design-Builder shall provide, install, and maintain four portable changeable message signs with a horizontal display to show regularly updated messages provided by the Department. These signs shall be located at entrances to the Project area, at both ends of the bridge and be legible to passing motorists traveling in any direction within the Project area.

#### 3.2.8.2 Public Meetings and Open Houses

Beginning one month before construction begins, the Department will conduct a minimum of 12 annual public meetings (monthly or at another interval determined by the Department) to update affected audiences, resolve complaints, etc. The PIL, a Design-Builder engineering executive with Department media training and other appropriate members of the Design-Builder's team shall attend. The PIL shall meet with the Department in advance to assist in planning each meeting.

#### 3.2.8.3 Information Materials

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

The PIL shall supply plans, maps, schedules, Project contact lists, and other information, as requested, to the Department to facilitate the creation of informational materials for business, resident, news media, or others. This information shall include graphic photo simulations of the bridge in context, updated as design changes occur.

The Design-Builder shall provide a portable physical model that shall be updated as design changes are made. The model shall be constructed of durable materials that are modular and sufficiently lightweight to easily transport. The model shall depict the bridge, approaches, water and landform, at a scale of 1:360 or 1:480, or at a scale between those two.

The Department shall review and approve all information materials prior to dissemination to any outside party.

## 3.3 [NOT USED]

## 3.4 [NOT USED]

## 3.5 Deliverables

Unless otherwise indicated, all deliverables shall be submitted in both electronic format and hardcopy format. Acceptable electronic formats include Microsoft Word, Microsoft Excel, or Adobe Acrobat (.PDF) files, unless otherwise indicated. At a minimum, the Design-Builder shall submit the following to Department:

| Deliverable | For Acceptance or Approval | Number/Type of Copies | | Submittal Schedule | Reference Section |
|---|---|---|---|---|---|
| | | Hardcopy | Electronic | | |
| PIL candidate qualifications, including resume | Approval | 2 | PDF | Within seven Days of NTP1 | 3.2.2 |
| Complete PIL contact information, including home, fax, mobile, and pager numbers | Acceptance | 2 | PDF | Within one Day of hiring PIL | 3.2.2 |
| Schedule for emergency service access communications | Acceptance | 2 | PDF | Within 14 Days of NTP1 | 3.2.6.1.5 |

| Deliverable | For Acceptance or Approval | Number/Type of Copies | | Submittal Schedule | Reference Section |
|---|---|---|---|---|---|
| | | Hardcopy | Electronic | | |
| Portable changeable message signs | Acceptance | NA | NA | During initial construction mobilization | 3.2.7.1.3 |
| Graphic project information | Acceptance | NA | TIFF or EPS for illustrations; PDF or Excel for schedules, charts, etc. | As requested | 3.2.7.3 |
| Portable scale model of bridge | Acceptance | NA | NA | Within 90 Days of NTP1 | 3.2.7.3 |

# EXHIBIT 3-A

Public Information Plan Template

This exhibit is provided as an electronic file.

# 4 ENVIRONMENTAL COMPLIANCE

## 4.1 General

The Design-Builder shall perform all Work necessary to meet the requirements for Environmental Compliance. The Design Builder shall comply with all applicable Environmental Laws and Governmental Approvals issued there under, whether obtained by the Department, or the Design Builder, and perform all Work necessary to meet the requirements for Environmental Compliance, mitigation measures, and other restrictions as set forth in the Standard Environmental Reference (www.dot.ca.gov/ser) and in any previously approved environmental documentation for the Project including here within the Mitigated Negative Declaration/Finding of No Significant Impact (MND/FONSI).

## 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 standard, 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 modified by Addendum or Change Order.

**Environmental Standards**

| Priority | Agency | Title |
|---|---|---|
| 1 | Department | Mitigated Negative Declaration/Finding of No Significant Impact (MND/FONSI) Exhibit 4-A, |
| 2 | Various | Various permits and agreements issued by local, state and federal agencies |
| 3 | Department | Standard Special Provisions |
| 4 | Department | Design Build Modifications to the Standard Specifications for Construction |
| 5 | Department | Standard Specifications |
| 6 | Department | Standard Plans |
| 7 | Department | 2006 Revised Standard Plans and New Standard Plans |
| 8 | Department | Construction Site Best Management Practices (BMPs) Manual |
| 9 | Department | CRWQCB Storm Water Pollution Prevention Plan (SWPPP) and Water Pollution Control Program (WPCP) Preparation Manual |
| 10 | Various | Technical Memoranda |
| 11 | Department | I-605 Storm Water Quality Master Plan |

| | | |
|---|---|---|
| 12 | LA County | CRWQCB Standard Urban Storm Water Mitigation Plan (SUSMP) |
| 13 | Department | Standard Environmental Reference (SER) |
| 14 | Department | Volume II, CT Environmental Handbook; Cultural Resources |
| 15 | Department | Volume III, CT Environmental Handbook; Biological Resources |
| 16 | Department | Volume IV, CT Environmental Handbook, Community Impact |
| 17 | Department | Construction Manual |
| 18 | Department | California Test Methods |
| 19 | DTSC/Department | California Department of Toxic Substances Control (DTSC), 2009, Variance No. V09HQSCD006, July 1 |
| 20 | Department | Survey Manual |
| 21 | Cal/EPA | Use of California Human Health Screening Levels (CHHSLs) in evaluation of contaminated properties (latest edition) |
| 22 | Cal/EPA | 2010, Soil Screening Numbers – Updated Table (9/23/10), http://oehha.ca.gov/risk/chhsltable.html |
| 23 | DTSC/CRWQCB | California Department of Toxic Substances Control (DTSC) and the California Regional Water Quality Control Board (CRWQCB), 2003, Advisory – Active Soil Gas Investigation |
| 24 | DTSC | Determination of a Southern California Regional Background Arsenic Concentration in Soil, March 2008 |
| 25 | CRWQCB | Maximum Soil Screening Levels for TPH, BTEX and MTBE above Drinking Water Aquifers, September 2006 |
| 26 | State of California | California Safe Drinking Water Act & Related Laws and Regulations (CCR Title 22, Article 5.5, Section 64444), March 9, 2008 |
| 27 | State of California | California Department of Water Resources, 1961, Bulletin No. 104, Planned Utilization of the Ground Water Basins of the Coastal Plain of Los Angeles County, Appendix A, Groundwater Geology, June 1961 |
| 28 | USEPA | USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, Final, Office of Superfund Remediation and Technology Innovation, Washington, D.C., June 2008 |
| 29 | USEPA | USEPA Contract Laboratory Program National Functional Guidelines for Superfund Inorganic Methods Data Review, Final, Office of Superfund Remediation and Technology Innovation, Washington, D.C., January 2010 |
| 29 | USEPA | Region 9, 2010, Regional Screening Levels for Chemical Contaminants at Superfund Sites, May 2010 |
| 30 | Department | Project Planning and Design Guide |

### *4.2.2 References*

Use the references listed below as supplementary guidelines for all environmental related analysis, design, and construction. These references have not established order of precedence.

**Environmental Publications References**

| Agency | Title |
|---|---|
| Department | District 7 Drainage Manual |
| Department | Erosion Control Handbook |
| Department | Erosion and Sediment Control |
| Department | Environmental Handbook Cultural Resources |
| Department | Aerially Deposited Lead Testing Guidance |
| Department | Ready-To-List and Construction Contract Award Guide (RTL Guide) |

### *4.2.3 [NOT USED]*

### *4.2.4 Mitigation Measures*

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

Mitigation measures may be subject to inspections by the Department and other environmental regulatory agencies.

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

### *4.2.5 Environmental Management Plan (EMP)*

The Design Builder shall submit an Environmental Management Plan (EMP) that describes the Design Builder's approach based on The Department' Mitigation Monitoring and Reporting Record for mitigating environmental impacts. The Design Builder shall develop and implement an environmental management plan that incorporates the following requirements

- Environmental personnel
- Environmental Protection and training
- Weekly and monthly reporting
- Environmental notification contact list
- Schedule of EMP activities
- Spill Containment and Countermeasure Plan
- Hazardous Materials Management Plan, including Sampling Analysis Work Plan (SAWP) for site assessment, site investigation, and Remedial Action Plan (RAP) for discovery of anticipated and unanticipated hazardous waste or contaminated soil, soil vapor, and groundwater

- Construction Noise Monitoring Plan
- Air Quality Management/monitoring Plan for Construction
- Asbestos survey and abatement Plan
- Lead-Based Paint survey and abatement Plan
- Storm Water Pollution Prevention Plan (SWPPP)
- Sedimentation and Erosion Control Plan
- Health and Safety Plan (General and Environmental)
- Aerially Deposited Lead (ADL) Lead Compliance Plan
- Debris Containment and Disposal Plan for Yellow Stripe and Pavement Marking
- Excavation, Transportation, and Disposal Plan for ADL Soil/Contaminated Materials
- Hazardous Waste Site Assessment (Environmental Site Assessment Phase I ESA), Site Investigation (Phase II) Reports for within and outside Right of Way (new Parcels)
- Soil, Soil Vapor, and Groundwater Sampling Work Plan
- Soil, Soil Vapor, and Groundwater Remedial Action Plan (RAP)
- Risk Assessment Report (when it is necessary to determine cleanup goals for soil, soil vapor, and groundwater)
- Hazardous Material Management Plan
- Fugitive Dust Emission Control Plan
- Wastewater Management Plan
- Standard Urban Storm Water Mitigation Plan (SUSMP)
- Groundwater Sampling Work Plan (for Dewatering Activities)
- Non-Petroleum Contaminated Soil Response Action Plan
- Finding of No Adverse Effect Report for Historic Properties

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

Provide documentation with copies of all environmental submittals, correspondence, and secured environmental approvals and maintain records of each in accordance with the guidelines herein.

If previously issued environmental approvals become invalid because of Design-Builder initiated changes to the Project, the Design Builder shall undertake all necessary actions, such as application revisions, supplements, reassessments, and coordination with the appropriate governmental entities, to secure or amend the environmental approvals. Pay any additional Project costs and accept responsibility for any schedule delays associated with securing the additional environmental approvals.

In cases that require assistance to coordinate directly with agencies, the Design Builder shall provide the necessary support regarding the Project design and potential environmental impacts in the form of personnel and/or data to assist in securing environmental approvals.

### 4.2.5.1 Environmental Personnel

#### 4.2.5.1.1 Environmental Personnel

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

The Design Builder shall designate an Environmental Compliance Manager (ECM) responsible for implementing the EMP. ECM will be the Design Builder's single contact point for all environmental issues. The designated ECM will have a minimum of five years experience as an environmental compliance manager for a highway Project similar in size and scope of work. The ECM will have experience managing the environmental monitoring for Projects with similar complexities. The ECM will have experience with permitting, and clearances for highway construction Projects.

#### 4.2.5.1.2 [NOT USED]

#### 4.2.5.1.3 Storm Water Pollution Prevention Plan Manager/Preparer

The Design Builder shall provide a Water Pollution Control Management (WPCM) and/or Storm Water Pollution Prevention Plan (SWPPP) Preparer that has the qualifications provided in the Construction General Permit and Caltrans Standard Special Provisions (SSP 07-345), and current Storm Water Quality Handbooks, SWPPP and Water Pollution Control Program (WPCP) Preparation Manual. The Design Builder's SWPPP Preparer shall be responsible for preparation and compliance with the NPDES permit.

#### 4.2.5.1.4 Certified Erosion and Sediment Control Supervisor

The Design Builder shall assign a Certified Erosion Control Supervisor(s) 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.

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

#### 4.2.5.1.5 Installer

Certified installers 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.

#### 4.2.5.2 Environmental Protection Training

##### 4.2.5.2.1 Environmental Protection Training

The Design Builder shall design and implement an environmental protection-training program for all of the Design Builder's employees and Subcontractors (including truck drivers and equipment operators).

Every employee of the Design Builder who works on the Project (management through workers, including each new employee who begins work after Project commencement) and all of the Design Builder's Subcontractors shall participate in an environmental protection training program.

The training program shall orient employees and subcontractors to the following:

- The overall importance of environmental issues in achieving a successful project
- The particular environmental sensitivities of the Project
- Erosion and sediment control procedures in accordance with the SWPPP including the functions and proper installation of Best Management Practices (BMPs) to be implemented on the project.
- Proper procedures for spill containment
- Proper and safe handling of contaminated soil and groundwater
- The Design Builder shall implement a training program to ensure all employees and Subcontractors are educated as to the construction noise abatement requirements.

The Department will provide assistance regarding clarification and understanding of the environmental goals and policies. The Design Builder shall notify the regulatory agencies and the Contract Manager 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.

### *4.2.6 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 Coordination with Other Agencies and Disciplines*

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

The Design Builder shall document the permit requirements and contacts with the permitting agencies.

### *4.2.8 Meetings*

The Department, the City of Baldwin Park, 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 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.

## 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 provision.

Protect the environment in accordance with the following performance requirements:

- Deliver the highest level of environmental commitment.
- Document and communicate the measures taken to minimize impacts on the environment from the design, construction, and the long-term operation of the Project.
- Develop, implement, operate and maintain an environmental management plan for the Project, including provisions for meeting all environmental commitments made in the ROD, MOA, and permit requirements, environmental monitoring and reporting, and enforcement of the environmental monitoring plan.
- Implement, document, and communicate environmental training of Design-Build team employees involved in environmental mitigation and as required by local, state, and federal regulation.
- Report violations of the governmental rules and environmental criteria within 24 hours or per requirements of the permits and regulations, whichever is sooner. Address violations of environmental criteria, permits, and commitments with appropriate and timely response.
- Obtain required environmental permits and approvals.
- Obtain amendments to required permits and approvals.
- Implement additional environmental commitments that result from Design-Builder actions and consultations with regulatory agencies.

### *4.3.1 Environmental Meeting*

The Design Builder shall take an inventory of all the environmental requirements in the Project. The Design Builder shall schedule an environmental concept meeting to present the requirements and the proposed actions to comply with these requirements.

The Design Builder shall use the results of the meeting to finalize the environmental needs of the Project.

## 4.4 Construction Requirements

### *4.4.1 Mitigation Measures*

The mitigation measures shall 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 Design Builder shall list environmental requirements, including watershed and local government consent conditions, and include recognition of Project-specific issues, procedural steps for mitigation, and particular actions planned to comply with the governing regulations.

Design Builder shall be responsible maintaining mitigation measures during the life of the Project to minimize and reduce potential environmental impacts. Design Builder shall conduct any additional studies

necessary to 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.

#### 4.4.1.2 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 the project be altered during the project design or construction phase, those changes that extend the project beyond the limits identified on the Area of Potential Effect (APE) map shall be reviewed by the Department Cultural Resources staff members to determine the need to obtain an environmental reevaluation. The Design Builder shall be responsible for the schedule impact, for procuring all necessary approvals and permits and for paying all fees required.

The project proposes constructing an elevated flyover structure from the southbound I-605 to eastbound I-10, which creates the need for raising the height of the transmission cables of the Boulder Dam-Los Angeles 287.5 kV Transmission Line Historic District. The transmission lines would be raised approximately 40 feet at the point where they cross over the proposed direct connector ramp. Modification of the.towers, would involve replacing 3 towers with 8 steel poles supporting the transmission lines at the crossing. . Although the Boulder Dam-Los Angeles 287.5 kV Transmission Line is eligible to as a historic property, the modification would not alter the characteristics of the historic property that qualify it for inclusion in the National Register. Changes to the historic district would be completed in a manner consistent with the Secretary of the Interior's Standards for the Treatment of Historic Properties –

**Public Utilities Commission General Order 131-D**

Under the PUC General Order 131-D, the project qualifies for exception *C; the minor relocation of existing power line facilities up to 2,000 feet in length, or the intersetting of additional support structures*

#### 4.4.1.3. Contaminated Materials

The Design Builder shall develop and implement a comprehensive environmental site assessment (ASTM E1527-05 Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment (ESA) Process) for new parcels that are to be acquired for the project. The purpose of the ESA is to identify recognized environmental conditions. The term recognized environmental conditions means the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, ground water, or surface water of the property. The term includes hazardous substances or petroleum products even under conditions in compliance with laws.

The Design Builder shall develop and implement a comprehensive Site Investigation (ASTM E1903-97(2002) Standard Guide for Environmental Site Assessments: Phase II Environmental Site Assessment (SI) Process and/or the Department Site Investigation Standard Protocol). The primary objectives of conducting a Phase II SI are to evaluate the recognized environmental conditions identified in the Phase I ESA for the purpose of providing sufficient information regarding the nature and extent of contamination to assist in making informed business decisions about the property; and where applicable, providing the level of knowledge necessary to satisfy the innocent purchaser defense under CERCLA. Where Phase I ESAs are an investigation of existing, ascertainable data regarding a particular site, Phase II Environmental Site Assessments/Investigations include generating site-specific data by collecting samples, conducting on-site testing and recording observations in regard to site conditions. The data collected are used in the decision making process to collect additional data, evaluate remedial options or seek regulatory site closure. The data collected may also be used to identify contaminant source areas, potential off-site sources and contaminant transport mechanisms.

Prior to any Phase II environmental site investigation, the Design Builder shall develop/prepare legally defensible work plans that include, Field Sampling and Analysis Plans, Data Quality Objective Plans, Quality Assurance and Quality Control Plans, and Health and Safety Plans in accordance with the project-specific requirements.

#### 4.4.1.3.1 Asbestos Containing Material (ACM) and Regulated Waste

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

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

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

#### 4.4.1.3.2 Health and Safety Plan

Recognized Hazardous Materials (RHM's) are defined as the presence or suspected presence of Hazardous Substances which may require management and/or disposal. Hazardous Substances 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 California Certified Industrial Hygienist licensed (CIH) by American Board of Industrial Hygiene shall approve the Hazardous Waste Operations Safety and Health Program and all project specific Health and Safety Plan including implementation of health and safety training for all field staff working with contaminated materials.

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

The HaSP shall be consistent with NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities; EPA Order 1440.1- Respiratory Protection; EPA Order 1440.3- Health and Safety Requirements for Employees Engaged in Field Activities; EPA Standard Operating Safety Guide; OSHA Regulations (29CFR 1910 and 1926); and State and Local regulations. Throughout the performance of the site investigation, the Design Builders shall, at a minimum, fully comply with Level D protection requirements. The designated site safety office shall be responsible for determining/need to upgrade to Level C or higher. On site upgrade to Level C may be determined by photo ionization detector (PID) readings for gasoline contamination. Flame ionization detector (FID) reading for diesel contamination during field activities or other field instruments required to detect for other airborne contaminants.

In the event that the Design-Builder encounters or has reason to believe it has encountered Hazardous Substances requiring Hazardous Waste Operations on the Project, the Design-Builder shall notify the Department verbally and proceed with the Hazardous Waste Operations work. The Design-Builder shall then notify the Department in writing 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 to the Department, as requested, regarding potential or actual exposure to the public.

The Design Builder shall maintain records of all related incidents and notify the Department and appropriate state authorities immediately.

The Design Builder shall be responsible for management of the Hazardous Materials and Hazardous Waste necessary for the Project. The Design Builder shall coordinate with the Department and regulatory agencies for all hazardous waste assessments, investigations, notifications, and permitting prior to waste management implementation in construction.

#### 4.4.1.3.3 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 and non-yellow lead based paint and/or thermoplastic paint traffic stripe and pavement marking, ADL and/or petroleum hydrocarbon contaminated soil/groundwater generated by 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 all pertinent site assessment and site investigation reports, Health and Safety Plan, Lead Compliance Plan, remedial action plan, Excavation and transportation Plan and all pertinent notifications/permits required by the regulatory agencies for waste management. When invoking the DTSC Lead Variance (DTSC, 2009), the Design Builder shall comply with the required notification process (stipulated in Caltrans standard special provisions 19-900, S5-740) and requirements as shown in the Variance. The information required for the Notification shall be prepared and provided to the Department to invoke the Variance. The Variance shall be submitted to DTSC 5 days before commencement of excavation activities. All draft documents for the regulatory agencies are to be provided for review and concurrence.

The Department 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 ensure that the Department receives copies of the manifests signed by the disposal facility.

Bills of lading (as required in Caltrans standard special provisions 19-900) 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 Department will verify the qualification of ADL material for reuse.

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 provide immediate notification to the Department of such conditions.

#### 4.4.1.3.4 Removal and Disposal of Yellow and Non-Yellow Thermoplastic and Lead Based paint traffic Stripe and Pavement Marking

Yellow traffic stripe and pavement marking removal pose 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) prepared by a Certified Industrial Hygienist (CIH) in accordance with Title 8 CCR §1532.1(e)(2) and Debris Containment and Disposal Plan for the removal/containment/disposal of the waste debris generated from the yellow stripe removal operation and shall be submitted to the Department for review and approval 15 days before fieldwork begins. Health and safety requirement, removal, containment, testing, transportation, and disposal shall comply with Caltrans standard special provisions 14-001. Although non-yellow (white/blue) traffic stripe and pavement marking post a low concentration of lead; however, a Lead Compliance Plan/training will also be required for the field worker prior to work commencement (refer to Caltrans standard special provisions 15-301/15-305)

#### 4.4.1.3.5 Soil and Groundwater - General

The Design Builder shall review all Phase I and Phase II Environmental Site Assessment (ESA) reports completed for the Project and implement all necessary mitigations as recommended. 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 assessment/investigation that may be needed to accommodate the work.

For phase II site investigation, the Design Builder shall drill, collect, and sample the soil, soil vapor and groundwater that are suspected to be contaminated. The Design Builder shall also provide a CIH/IH to be onsite to monitor soil excavation activities and evaluate the appropriate waste management procedures in conformance with Federal, State, and Local regulations. 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.

#### 4.4.1.3.6 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 screening levels, visual staining or olfactory evidence) have been encountered in the Project area, the Design Builder shall be responsible for notifying the Department and to proceed with field confirmative sampling to verify the extent of the contamination. The data/information gathered from the field sampling shall be reported to the Department and the appropriate Federal, State or local regulatory agencies.

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

The Design Builder shall stockpile all contaminated material or soil encountered within excavation limits as described below in Temporary Stockpile of Contaminated Material. The work to excavate, haul to the designated sites on the Project, and stockpile the contaminated soils shall be considered as included in the baseline work. 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.

The Design Builder’s Excavation and Transportation Plan/Waste Disposal Plan for contaminated soil may include re-using the contaminated soil in fill areas on this Project (only if the test results/information has

been reviewed and approved by the Department). The Design Builder shall locate the contaminated soil on the As-Built Plans.

The Design Builder may determine that some or all of the contaminated soil and all of the contaminated materials must be disposed at a California and/or out of State-permitted disposal facility and/or treatment/recycle facility. Prior approval from the Department is required for the selection of the waste disposal facility.

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 for the Department Environmental Specialist to collect and analyze any additional samples required by the landfill.

The Design Builder shall provide the landfill-required waste profile form(s) to the Department for review and signature. The Department will provide an EPA waste generator/manifest ID # to Design Builder prior to commencement of waste disposal.

The Design Builder shall not haul contaminated material to the landfill facility until the Design Builder has written approval from the landfill accepting the contaminated material for disposal at the landfill facility and the Department approved the selected disposal facility.

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

#### 4.4.1.3.7 Temporary Stockpile of Contaminated Soil

In the event if soil stockpiling is required during construction, the stockpile shall be placed at a location selected and approved by the Department within the Project limit and/or along the project corridor. The Design Builder shall stockpile the contaminated soil on minimum 10-mil plastic impermeable liner, and cover the stockpile with minimum 10-mil reinforced plastic impermeable liner. The stockpile cover shall be securely anchored. The Design Builder shall provide primary and secondary containments for the stockpiles. The Design Builder shall prevent the migration of stockpiled soil by wind or water. Fencing shall surround the stockpile and appropriate signage posted to notify that the stockpile contains hazardous materials/substances. The Design Builder shall be responsible for the maintenance of the stockpile cover for the duration of the Contract or until all contaminated material is removed. The Design Builder shall inspect the stockpile a minimum of once per day. The Design Builder shall keep records of the daily 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.

#### 4.4.1.3.8 Contaminated Groundwater Contingency Plan

The project area is within the area of the San Gabriel Valley groundwater contamination plume designated on the United States Environmental Protection Agency National Priority List (San Gabriel Valley Area 2, Baldwin Park Operable Unit). The primary contaminants of concern in the groundwater include perchloroethylene (PCE), trichloroethylene (TCE), 1,2 dichlorethane (1,2 DCA), carbon tetrachloride (CTC), perchlorate, 1,4-dioxane, and N-nitrosodimethylamine (NDMA).

A *Final Report, Remedial Investigation San Gabriel Valley Area 3 Superfund Site,* prepared by CH2M HILL for the United States Environmental Protection Agency (USEPA), Region 9, shows the project area is located over the groundwater contamination plume within the boundary of the Baldwin Park Operable Unit. A

groundwater extraction system is installed to extract and remediate contaminated groundwater. Based on information in the *2008 Annual Performance Evaluation Report, Baldwin Park Operable Unit of the San Gabriel Valley Superfund Sites*, the estimated depth to groundwater under the project area is around 60 feet below ground surface. The groundwater contamination plume is sinking in the aquifer and cross-sections in the report shows approximately 200 feet of uncontaminated groundwater above the top of the contamination plume in the vicinity of the project area. However, the Design Builder shall assume that contaminated groundwater is also present in the shallower portion of the aquifer. Because of the potential for encountering contaminated groundwater, all groundwater dewatering necessary to complete the Project must be done under the assumption that the dewatered groundwater is contaminated.

The Design Builder shall notify the USEPA, Region 9 and the Department if construction impact groundwater or dewatering is planned and acquire all permits and approvals that the dewatering action will not impact the USEPA activities to remediate the contaminated groundwater.

The Design Builder shall notify the Department 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 the groundwater. The Design Builder shall minimize Project dewatering to the greatest extent possible.

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

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

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

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

#### 4.4.1.3.9 Ground Water Quality

The Design Builder shall refer to the project specific geotechnical boring log and/or site investigation reports for available groundwater depth data. If the Design Builder required performing dewatering activity during construction at any location along the project, groundwater samples shall be collected and analyzed for contaminants of concern by the Design Builder. The Design Builder shall submit a Ground Water Quality Sampling Work Plan to the Department for comments and approval.

#### 4.4.1.3.10 Aerially Deposited Lead

Aerially deposited lead is lead deposited within unpaved areas or formerly unpaved areas, primarily due to historical vehicle emissions which is ceased in mid 1980's.

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

- Site Investigation (SI) Report, LA-10 Freeway PM 31.1/33.4, by GEOCON Environmental Consultants, dated May 1, 1995, (Caltrans ID# 103)
- Site Investigation Report, Bess-Frazier Pedestrian Overcrossing; SR-237, GEOCON Environmental Consultants, January 17, 1995, (Caltrans ID # 113)
- Lead Investigation Report, Interstate 10 HOV Widening Project, Ninyo-Moore, dated October 24, 2002 (Caltrans ID# 569)

These reports were done for other project; however they are within and/or near this project vicinity. The Design Builder shall conduct ADL soil investigation (in-site soil sampling) for this project to evaluate the extent of ADL contamination and to propose waste management procedure in construction according to the State and Federal requirements. The Design Builder shall prepare and submit an ADL site investigation Work Plan (including the health and safety plan) to the Department for review and acceptance prior to conduct sampling activities. The Design Builder shall use a laboratory certified by the California Department of Health Services for testing of samples. Sampling, analysis and reporting of test results shall be performed according to USEPA, SW-846 "Test Methods for Evaluating Solid Waste," Volume II; Field Manual Physical/Chemical, Chapter Nine, Section 9.1, and Caltrans Aerially Deposited Lead Guidance.

The Design Builder shall compare the data results from the ADL site investigation to determine: 1) whether is soil is non-hazardous and can be reused on the project site without restriction; 2) the soil is hazardous waste regulated by the State of California (non-RCRA) but permitted to be reused on site provided it meets the DTSC Lead Variance (DTSC, 2009); or 3) the soil is hazardous waste regulated by Federal government (RCRA) and it requires off-site disposal at a permitted disposal facility.

##### 4.4.1.3.10.1 GIS Data Collection

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

##### 4.4.1.3.10.2 Borehole Naming Convention

For Borehole naming convention, the Design Builder shall use a 3-digit unique ID assigned by the Department followed by a dash and sequential boring numbers beginning with "101". (Example: the assigned Unique ID is 123, the borehole names would be 123-101-0.5', 123-102-1.0', 123-103-2.0', etc.)

The sample data and analytical results shall be recorded in the appropriate tables. Note that the database tables are related such that the borehole data record must be created first, followed by sample data records, and finally the analytical result records.

The Design Builder shall collect GPS data at the completion of each boring sample.

The Design Builder shall be provided with a MS-ACCESS database to store the recorded GIS sampling data of the boring locations/samples. The GIS data shall be submitted along with the draft/final site investigation report to the Department for review and acceptance.

The Design Builder shall follow the the Department ADL Site Investigation Protocol and Standard to conduct the ADL site investigation. The ADL sampling depths shall conform to the proposed planned excavation depths of the project. Please note that ADL soil typically yields the highest concentrations at or near the surface (upper shallow soils) and therefore, the investigative intervals at the upper surface zone should not varies more than 6" in between samples.

The Design Builder shall submit to the Department, for review and approval, an ADL Site Investigation Work Plan at least 21 days prior to sampling and testing areas for ADL, pH and Title 22 metals. All samples shall be tested for total lead, Total Threshold Limit Concentration (TTLC). All samples with TTLC exceeding 50 mg/kg shall be tested for soluble lead, Soluble Threshold Limit Concentration (STLC), using the California Waste Extraction Test (WET) by EPA Method 3050A (Citrate Acid). Any STLC results equal to or greater than 5 mg/L shall be tested using the De-Ionized Water (DI-WET) method. Any TTLC results at or exceeding 1,000 mg/kg shall be tested using the Toxicity Characteristic leaching Procedure (TCLP) with extraction by EPA Method 1311. If no samples greater than 1,000 mg/kg, a total of 40% of all soil samples with the highest TTLC values shall be tested using the TCLP method. 10% of all samples shall be tested for pH. 5% of all soil samples with highest TTLC values shall be tested for Title 22 metals.

Prior to invoking the DTSC Lead Variance (DTSC, 2009), the Design Builder shall coordinate with the Department and provide the necessary plans and investigation reports to the Department for the Variance Notification process (refer to the DTSC Lead Variance and Caltrans standard special provisions 19-900 and S5-740 for specific requirements).

The Design Builder shall prepare construction detail plans and contract special provisions identifying the limits, extent of ADL, and handling of ADL in accordance with the Variance for each design submittal. The Design Builder shall prepare an LCP and an Evacuation, Transportation, and Disposal Plan (ETDP) for ADL soil management. The LCP and ETDP shall be submitted to the Department for review and approval 10 days prior to excavation activities. The LCP shall be prepared by a CIH certified in the State of California shall prevent or minimize worker exposure to lead while handling material containing ADL. The LCP shall be prepared by a certified industrial hygienist (CIH) and the LCP 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 performs earthwork activities.

The ETDP, at a minimum, shall include a tentative excavation schedule, temporary locations of stockpiled material, appropriate plastic sheeting to cover the stockpiles, locations of samples and laboratory results, dust control measures, truck staging area, spill contingency plan, hazardous waste transporter certification, disposal site permit and location.

Excavation, transportation, reuse and disposal of material containing ADL shall be in conformance with Federal and State laws and regulations, as amended, and county and municipal ordinances and regulations, as amended, including but not limited to:

- United States Department of Transportation (USDOT)
- United States Environmental Protection Agency (EPA)
- California Environmental Protection Agency (Cal-EPA)
- California Department of Health Services
- Department of Toxic Substances Control (DTSC), Region 3
- California Division of Occupational Safety and Health Administration (Cal-OSHA)
- Integrated Waste Management Board
- Regional Water quality Control Board (RWQCB), Region 4

- State Air Resources Control Board
- South Coast Air Quality Management District
- California Health and Safety Code, Division 20, Chapter 6.5 (California Hazardous Waste Control Act)
- Title 22, California Code of Regulations, Division 4.5 (Environmental Health Standards for the Management of Hazardous Waste)
- Title 8, California Code of Regulations

The Design Builder shall prepare the draft/final ADL site investigation reports in accordance with Caltrans ADL Reporting Guideline; Caltrans ADL soil classifications; and DTSC Lead Variance (DTSC, 2009). The ADL Reporting Guidance can be provided upon request.

The Design Builder's bid should assume the Project contains the following ADL types:

- Type Y-1 ADL (Non-RCRA Waste allow for reuse conforming to Variance (DTSC, 2009)
- Type Y-2 ADL (Non-RCRA Waste allow for reuse conforming to Variance (DTSC, 2009)
- Type Z-2 ADL (Non-RCRA Waste for off-site disposal at a permitted Class I disposal facility);
- Type Z-3 ADL (RCRA Waste for off-site disposal at a permitted Class I disposal facility)

In the event if the Design Builder elected to perform over-excavation for its construction convenience, the Design Builder shall be responsible for disposing the excess ADL soil quantity at his/her expense. The Design Builder shall also be identified as the generator of such material and will sign all manifests per the waste disposal requirements.

Once the Design Builder has completed the placement of material containing aerially deposited lead in conformance with the requirements of the Contract Documents and DTSC's Lead Variance, the Design Builder shall have no further responsibility for such materials in place. The Department will not consider the Design Builder a generator of such contaminated materials. Further cleanup, removal or remedial actions for such materials will not be required if handled or disposed of as specified herein. When invoking the DTSC Lead Variance, the Design Builder is required to provide contract documents to the Department for the notification process 5 days before the start of excavation. The Notification package shall be prepared in accordance with the requirements stipulated in Caltrans standard special provisions and DTSC Lead Variance (DTSC, 2009)

#### 4.4.1.3.11 Spill Containment and Countermeasure Plan

The Design Builder shall prepare a 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. 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. At the discretion of the Contract Manager, this Spill Contingency and Countermeasure Plan can be prepared as part of the Excavation, Transportation, and Disposal Plan (ETDP).

#### 4.4.1.3.12 Hazardous Materials Management Plan

The Design Builder shall prepare a Hazardous Materials Management Plan to describe the Design Builder's plans to handle hazardous materials including procedure for discovery of unanticipated hazardous waste or contaminated materials.

#### 4.4.1.4 Wells

Prior to the start of construction, the Design Builder shall locate all wells, including active and inactive potable and non-potable wells, piezometers, abandoned wells, and monitoring wells within the Project limits. The Design Builder shall provide recommendations to the Department on which wells shall be abandoned. The Department will provide written notification to the Design Builder whether to abandon and/or relocate the wells. The wells shall be abandoned by a Design Builder licensed by the California Department of Health in accordance with the Water Well Construction Code. Well Abandonment Work Plan shall be provided to the Department for review and acceptance prior to work commencement. Upon completion of the well abandonment, a Well Abandonment Completion Report shall be provided to the Department for review and acceptance. For active wells that must remain in place during construction (typically monitoring wells), the Design Builder shall protect the wells and conduct all activities in a manner that will not damage or jeopardize the wells. Replacement or repair of wells damaged by the Design Builder shall be at the expense of the Design Builder.

#### 4.4.1.5 Noise

##### 4.4.1.5.1 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 noise 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 50 feet 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. Both plans shall be prepared by an Acoustical Engineer.

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.

The Department has received a variance from Board of Police Commissioners for general nighttime and weekend construction for this Design Build Contract. The Design Builder may schedule Work at night, but shall comply with provisions of the City of Baldwin Park Code, and the General Requirements.

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 or use CIDH method.

- Constructing temporary sound walls or curtains around stationary equipment or other noise-producing construction activities that must be located close to residences or close to the equipment to decrease noise levels at nearby sensitive receptors.
- To minimize sound levels during construction, sound walls included as part of the Project shall be constructed prior to other construction activities where feasible (constructability issues or cost constraints may limit where this mitigation measure is reasonable)
- Using resilient bed liners in dump trucks to be loaded onsite during nighttime hours.
- Develop and implement a noise reduction plan that outlines compliance with standards and local noise ordinances
- The Design Builder shall provide at least seven (7) days notice to affected communities for any necessary blasting and/or loud construction activities, such as pile-driving or jack hammering.
- The Design Builder shall fit all internal combustion motors with mufflers and other noise control equipment as specified by the manufacturer.
- The Design Builder shall outfit construction equipment engines with adequate mufflers, intake silencers, and engine enclosures to reduce their noise levels by 5 to 10 dBA.
- The Design Builder shall turn off construction equipment during prolonged periods of nonuse to eliminate noise.
- The Design Builder shall maintain all equipment and train its equipment operators in good practices to reduce noise levels.
- The Design Builder shall perform aggressive public information activities to notify nearby residents of the expected start and completion of noise producing construction activities.
- The Design Builder shall use ambient sound-sensing backup alarms that could reduce disturbances from backup alarms during quieter construction periods.
- The Design Builder shall locate stationary equipment away from receiving properties to decrease noise.
- The Design Builder shall, at all times, be responsible for addressing the concerns and policies of the Department, FHWA, local governments, and roadside neighbors throughout the design and construction of the Project.
- The Design Builder shall implement a training program to ensure all employees and Subcontractors are educated as to the construction noise abatement requirements.
- The Design Builder shall be responsible for responding to all public complaints relating to construction noise from the Design Builder's operation including noise measurements and implementing appropriate noise mitigation measures during construction. Noise mitigation measures include, but not limited to, changing the location of stationary construction equipment, turning off idling equipment, rescheduling construction activities, notifying adjacent residents in advance of construction work, installing acoustic barriers around stationary construction noise sources or providing temporary relocation.
- The Design Builder shall develop Project specific provisions to communicate how advance notification of nighttime construction activities will occur.
- If construction activities cannot comply with restrictions outlined by local noise ordinance, the Design Builder shall obtain variance from restrictions.

#### 4.4.1.5.2 Sound walls

Prior to construction of sound walls 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 sound walls. Trees whose drip lines fall within the limits of proposed sound walls 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 to the Department prior to proceeding with the Work in order to determine appropriate mitigation replacement.

The general locations of the noise mitigations identified are provided in the Preliminary Engineering Documents, MND/FONSI or project noise technical reports for the Project. Specific lengths and heights of sound walls are provided in the MND/FONSI or project noise technical report for the project. Sound walls shall be constructed at the locations proposed in the Project Noise Technical Report and the Preliminary Engineering Documents for the project.

The Design Builder shall comply with the requirements concerning architectural treatments for sound walls.

If Design-Builder initiated changes require a change in location of sound walls, conduct all necessary engineering studies at the new locations as needed and assure compliance with applicable standards. The Design-Builder shall submit to the Department for review and concurrence on any studies necessary or required for changes in proposed soundwall/abatement measures.

#### 4.4.1.5.3 Traffic Noise

The Design Builder shall be responsible for noise analyses and mitigation measures in compliance with the requirements of the MND/FONSI or project noise technical report and the Engineering Documents. Noise analysis and mitigation shall be in conformance with Caltrans Noise Protocol (dated August 2006). 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 mitigation measures within the project limits and, lengths and heights for sound walls are provided in the MND/FONSI or project noise technical report.

### 4.4.1.6 Air Quality

The Design Builder shall mitigate construction/grading activities that disrupt ground cover by controlling fugitive dust emissions and other airborne particulates in accordance with these provisions, including measures such as applying water to exposed soils and limiting the extent and duration of exposed soil conditions. The Design Builder shall prepare and implement a Generated Waste Management Plan, and a Storm Water Pollution Prevention Plan (SWPPP). The Generated Waste Management Plan shall be prepared and implemented in accordance with Title 22, Division 4.5, California Code of Regulations (CCR), and all other applicable laws and regulations.

The Design Builder shall comply with the following South Coast Air Quality Management District (SCAQMD) Rules and Regulations (Rule 403, Limitation on Fugitive Dust Emissions as amended on June 3, 2005; Rule 402, Nuisance as amended on May 7, 1976; and Rule 401, Visible Emissions as amended on November 9, 2001):

- The Design Builder shall designate a staff member as the Air Pollution Control representative, knowledgeable in environmental matters. The representative shall be responsible for ensuring compliance with the Fugitive Dust Emissions Control Plan, its preparation, submittal, implementation, monitoring, and record keeping.

- The Design Builder shall not cause or allow emissions of fugitive dust from any transport, handling, construction or storage activity to remain visible in atmosphere beyond property line of the emission source.
- The Design Builder shall take precautions to minimize fugitive dust emissions from operations involving demolition, excavation, grading, clearing of land, and disposal of solid waste. Utilize at least one Temporary Best Management Practices (BMPs) for each source of fugitive dust.
- The Design Builder shall not cause or allow particulate matter to exceed 50µg/$m^3$ when determined as difference between upwind and downwind samples collected on high volume particulate matter samplers or other EPA approved equivalent method for PM-10 monitoring at the property line for a five-hour period during the time of active operations. The decision to conduct sampling will be made by SCAQMD and SCAQMD will conduct necessary sampling.
- The Design Builder shall prevent or immediately remove the track-out of bulk material onto public paved roadways as a result of Design Builder's operations, or take at least one of the actions listed in Table 3 of Rule 403, and prevent the track-out of bulk material onto public paved roadways, and remove such material at any time track-out extends for more than 25 feet onto any paved public road, and remove all visible roadway dust tracked-out upon public paved roadways at the end of each Work day when active operations cease.

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

- Trucks transporting soil, sand, other excavated, or backfill materials to or from the sites shall be covered with a tarpaulin from the point of origin to the point of unloading.
- Daily or more frequently, if necessary, water down and sweep streets around and near to the site that have heavy volumes of construction vehicles carrying debris and excavated materials, and adjacent sidewalks.
- Establish regular cycles and locations for cleaning trucks that haul soil from site.
- Water down construction sites according to SCAQMD Rule 403, as required to suppress dust, during grading, handling of excavation soil or debris, or during demolition.
- If conveyors are used, cover all transfer points along conveyor system moving soil. Minimize drop height to the stockpile. Provide a sprinkler system that will apply water to soil before it drops to stockpile.
- Any adopted measures further developed by SCAQMD on Best Available Control Measures (BACM) for Fugitive Dust and Rule 403 shall be incorporated into the site operations for fugitive dust control.(this is repeated above)
- Shut off construction equipment when not in use to reduce idling, according to the rules and regulations by ARB and SCAQMD.
- Adhere to burning restrictions.
- Control local source plant operations (e.g. asphalt, cement, crushing restrictions).
- Minimize hauling.

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

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

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

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

The Design Builder shall, at all times, be responsible for responding to the concerns and policies of the Department , USEPA, FHWA, ARB, SCAQMD , local governments, and roadside neighbors throughout the design and building of the Project as they relate to air quality impacts.

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

#### 4.4.1.7 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.). The 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. For the storm water discharge option, the Design Builder will NOT be allowed to discharge construction wastewater (other than storm water) from the site unless the Design Builder chooses to file 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 notify the Department 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 County of Los Angeles Bureau of Sanitation. The Design Builder must obtain and comply with all terms and conditions of the permit, including discharge limitations. The sewer permit may contain a total discharge limitation between 100,000 and 150,000 gallons per day, and may contain hour restrictions for water discharges.

- No discharges other than storm water may be discharged into the storm drain, unless Design Builder obtains an applicable NPDES permit from the Los Angeles Regional Water Quality Control Board. Design Builder is responsible for obtaining NPDES permits. If used, Design Builder must comply with all terms

and conditions of their NPDES permit. Discharges to the storm drain must be in compliance with the NPDES permit.

- Submit, 30 days after NTP, a fully detailed Wastewater Management Plan for Project discharges for approval by the Department.
- Prepare and submit a Storm Water Pollution Prevention Plan in accordance with the Clean Water Act, NPDES General Permit for construction discharges, and related federal and state laws and regulations. SWPPP shall be submitted within 30 days of NTP.
- As required, prepare a Standard Urban Storm Water Mitigation Plan (SUSMP), according to the guidelines developed by the City of Baldwin Park Watershed Division or the Los Angeles County Department of Public Works Watershed Management Division.
- All connections and transport of wastewaters shall be by closed conduit. If necessary install and maintain pumps to deliver wastewaters to their destination(s).
- Design Builder Testing Requirements – At the frequency required by permit, sample and test effluent quality for those parameters of 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. The Department is intolerant towards noncompliant discharges.
- 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.

### 4.4.1.8 Waters and Wetlands

The Design Builder shall comply with all regulatory requirements related to Waters and Wetlands as stated in the Environmental Document.

#### 4.4.1.8.1 General Migratory Bird Treaty Act

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

- Between February 1 and September 1, the Design Builder shall notify the Department 15 days prior to beginning work disturbing structures, the ground or vegetation to perform surveys. The Department will approve the beginning of work disturbing the ground or vegetation between February 15 and September 1.
- The Design Builder shall be responsible for completing the migratory bird nest survey within the Project limits prior to construction.
- The Design Builder is required to provide documentation identifying the number of nests removed and whether or not the nests are occupied with eggs or nestlings.

#### 4.4.1.9 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-Landscape and Irrigation of the Technical Provisions for erosion control.

#### 4.4.1.10 Visual Setting

The Design Builder shall follow the requirements in Section 15-Visual Quality Management of these Technical Provisions for visual requirements.

#### 4.4.1.11 Parks and Recreation

The Work is anticipated to impact Local Agency parks. Where Work impacts Local Agency parks, the Design Builder shall comply with the requirements of the Local Agency Parks and Recreation Department. The Design Builder shall be responsible for obtaining advance approvals from the Parks and Recreation Department for all proposed Work within Local Agency parks, including but not limited to landscaping and irrigation modifications, planter beds, sidewalks, retaining walls, noise barriers, and park facilities. The Design Builder shall be responsible for coordinating with State Agencies and the Local Agency Parks and Recreation Department for any impacts to recreational trails within the Project limits. Approval will be required for any modifications of trails or associated facilities.

### *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

### *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, Department, governmental entities, and regulatory agencies regarding environmental matters.
- Specify the chain of contact.
- Include for each contact the person's name; agency or corporate affiliation; address; e-mail address; home, 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 final Right of Way
- Violation of permits and regulations such as:
  - ✓ 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 for Approval. The Department will respond to the EMP submittal within 15 Days.

### *4.5.2 Environmental Documents*

The Design Builder shall submit the following documents to the Department and must receive the Department Approval prior to construction.

- Storm Water Pollution Prevention Plan and amendments, as required, to reflect Project development and staging
- Storm Water Data Reprot (SWDR)
- Environmental Notification Contact List

The Design Builder shall submit the following documents to the Department for approval.

#### 4.5.2.1 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 to the Department no later than 30 Days after all abatement/removal actions are complete.

#### 4.5.2.2 Contaminated Materials

- Spill Containment and Countermeasure Plan
- Hazardous Materials Management Plan, including Sampling Analysis Work Plan (SAWP) for site assessment, site investigation, and Remedial Action Plan (RAP) for discovery of anticipated and unanticipated hazardous waste or contaminated soil, soil vapor, and groundwater
- Asbestos survey and abatement Plan
- Lead-Based Paint survey and abatement Plan
- Evacuation and Transportation Plan
- Mitigation Monitoring Implementation Plan
- Health and Safety Plan
- Aerially Deposited Lead (ADL) Lead Compliance Plan
- Debris Containment and Disposal Plan for Yellow Stripe and Pavement Marking

- Excavation and Transportation Plan for ADL Soil/Contaminated Materials
- Hazardous Waste Site Assessment (Environmental Site Assessment Phase I ESA), Site Investigation (Phase II) Reports for within and outside Right of Way (new Parcels)
- Soil, Soil Vapor, and Groundwater Sampling Work Plan
- Soil, Soil Vapor, and Groundwater Remedial Action Plan (RAP)
- Risk Assessment Report (when it is necessary to determine cleanup goals for soil, soil vapor, and groundwater)
- Hazardous Material Management Plan
- Wastewater Management Plan
- Groundwater Sampling Work Plan (for Dewatering Activities)
- Non-Petroleum Contaminated Soil Response Action Plan

#### 4.5.2.3 Groundwater

- Groundwater Discharge Report – Shall be submitted weekly.
- Contaminated Groundwater Dewatering Plan – Shall be submitted for Approval.
- Contaminated Groundwater Documentation Report – Shall be submitted for Acceptance no later than 60 Days after all contaminated groundwater dewatering actions are complete.
- Wastewater Management Plan – Shall be submitted for Approval.

The Design Builder shall submit the following documents to the Department prior to Final Acceptance.

- 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 to the Department on a monthly basis or as directed by the Department.

### *4.5.4 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.
- Copies of applications for environmental approvals other than the provided approvals for review and to approval agency(s).
- Copies of all environmental submittals, correspondence, and secured environmental approvals.
- Noise reduction plan that outlines compliance with standards and local noise ordinances.

- Plan to communicate how advance notification of nighttime construction activities will occur.
- Copies of well abandonment forms submitted for each of the wells that are abandoned as a result of the Project.
- Hazardous Waste Contingency Plan.
- All final reports for environmental work.

### *4.4.5 As-Builts 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 requirements of Final Design Documents.

#### *4.5.6 Measurement and Payment*

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

# EXHIBIT 4-A

Mitigated Negative Declaration/Finding of No Significant Impact (MND/FONSI)

This exhibit is provided as an electronic file

# EXHIBIT 4-B

Hazardous Materials Disclosure Document- Acquisition

This exhibit is provided as an electronic file.

# EXHIBIT 4-C

NEPA/CEQA Re-Validation Form

This exhibit is provided as an electronic file.

# 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 and these Technical Provisions. Responsibilities include, but are not limited to research existing utility information, identification of utility conflicts, review relocation plans, approval of relocation plans, and coordinate/monitor the physical utility relocation. This section applies to existing and proposed underground and overhead Utilities. The Design-Builder may be required to perform utility relocation design work or/and physical relocation under a separate Work Order. All work associated with temporary Relocations of Public and Private Utilities impacted by the Project and the Design-Builder's operations are the responsibility of the Design-Builder.

The Design Builder shall coordinate with the local agencies to ensure that the appropriate local ordinance and utility relocation requirements are also met.

### *6.1.1 Utility Involvement*

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

## 6.2 Administrative Requirements

### *6.2.1* Standards

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

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

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

Use the most current version of each listed standard as of the Request For Proposals (RFP) issue date unless modified by addendum or contract change order.

| Priority | Agency | Title |
|---|---|---|
| 1 | Department | Policy on High and Low Risk Underground Facilities Within Highway Rights of Way |
| 2 | Department | Encroachment Permit Manual |
| 3 | Department | R/W Manual |
| 4 | Department | Design Information Bulletins |
| 5 | Department | Standard Special Provisions |
| 6 | Department | Standard Specifications |
| 7 | Department | Standard Plans |
| 8 | Department | Highway Design Manual |
| 9 | California | California Streets and Highways Code |

| | | |
|---|---|---|
| 10 | AASHTO | A Policy on the Accommodation of Utilities within Freeway Right-of-Way |
| 11 | AASHTO | A Guide for Accommodation Utilities within Highway Right-of-Way |
| 12 | Department | Project Development Procedures Manual |
| 13 | Department | Plans Preparation Manual |
| 14 | Department | CADD Users Manual |

### *6.2.2 Responsibility*

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

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

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

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

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

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

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

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

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

Upon completion of all Utilties Work the Design-Builder shall provide the Department with Utility Plans with all required utilities information plotted as detailed in the Plans Preparation Manual and CADD Users Manual.

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 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 encroachment permit by the Department.

### 6.2.2.1 Design-Builder Responsibilities

#### 6.2.2.2.1.1 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.

#### 6.2.2.1.2 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.

#### 6.2.2.1.3 Utility Relocation Plans

The Design Builder shall prepare Utility Relocation Plans as per Caltrans Plans Preparation Manual for all Utility Work except when superseded by City or County standards outside the Department right-of-way.

### *6.2.3 Procedures and Agreements*

#### 6.2.3.1 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 Master Utility Agreement (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 Department has identified the LADWP 288KV power lines crossing the freeway centerline at Station 1656+23.340, Station 1656+35.269 and 1656+47.196. These lines will be in conflict with this project. The

Department anticipates that LADWP will complete relocation of these lines by January 31, 2013. Therefore, the Design-Builder should not anticipate this area of the project to be available for construction until after this date. Additionally, LADWP has provided a list of "Standard Conditions for Construction" that the Design-Builder shall comply with. (Exhibit 6-A)

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. Points of conflict for known Utility Companies within the project limits are identified on the Utility Agency contact list. (Exhibit 6-B)

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.

#### 6.2.3.2 Newly Discovered Utilities

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

#### 6.2.3.3 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 the 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 the 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.

#### 6.2.3.4 Utility Encroachment 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 encroachment permits, the Design-Builder shall coordinate with the Utility Owner to obtain all construction-related local entity Utility encroachment permits and the Department Utility encroachment permits, and/or Construction Easements or agreements. The Design-Builder shall comply with such Utility encroachment permits and Construction Easements or agreements. Separate encroachment permits may be required for Work on streets under local entity jurisdictions. A Utility encroachment 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 upon notification to the Department by the Design – Builder of an acceptable relocation plan as defined in Section 6.2.1

If the Utility Owner performs the relocation, the Utility Owner is responsible to secure the construction easement if needed if not otherwise in conflict with Book 2 Section7. If the Design-Builder performs the task, the Department is responsible to secure the construction easement in coordination with Design-Builder per Book 2 Section 7.

##### 6.2.3.4.1 Encroachments in Caltrans Right of Way

An encroachment, as defined in Section 660 of the California Streets and Highways Code, can be any tower, pole, pole line, pipe, pipe line, fence, billboard, stand or building, or any structure or object of any kind or character which is within the right of way but not a part of the Caltrans facility. Authority for Caltrans to control encroachments within the State highway is contained in the Streets and Highways Code starting with Section 660. Caltrans policy with regard to freeways and expressways is to exclude utilities from within access controlled rights of way, to the extent practicable. It recognizes that freeway rights of way are a valuable commodity, and that such value to the traveling public could be seriously eroded by allowing uncontrolled access by utilities. The policy is intended to provide a safe environment for traffic operations, minimize the disruption to the traveling public, and assure the safety of utility employees during maintenance of their facilities.

#### 6.2.3.5 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 Exhibit 6-C 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 Utility Design Sheet (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.

### *6.2.4 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.

#### 6.2.4.1 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.

##### 6.2.4.1.1 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.

### 6.2.4.2 Scheduling

The Utility Information Sheets (UIS) s 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.

### 6.2.4.3 Cost Estimates

The Department will reimburse a Utility Owner for actual costs in connection with a Utility Relocation where liability has been previously determined to qualify for reimbursement. 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.

### 6.2.4.4 Overrun of Estimated Cost

#### 6.2.4.4.1 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.

#### 6.2.4.4.2 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.

#### 6.2.4.5 Notifications

##### 6.2.4.5.1 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.

### *6.2.5 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.

## 6.3 Design Requirements

### *6.3.1 General*

All design furnished by the Design-Builder and all reviews and approvals by the Design-Builder of design furnished by the Utility Owners shall be in full compliance with the requirements of the applicable Utility Agreements and Standards, 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 encroachment permits, and with the Design-Builder's design and construction of the Project. In case of conflicts, the most stringent standards or requirements will govern. The Design-Builder shall obtain information regarding the standard design plans the Utility Owners routinely use for their Utility Work.

### *6.3.3 Verification*

The Design-Builder shall take all actions necessary to identify and verify 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.

### *6.3.4* Utility Conflict Map

When the Design-Builder has achieved a level of design to determine Utility conflict(s), the Design-Builder shall prepare a Utility 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 Utility Conflict Map sheets shall include the following:

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

- Existing Utilities

### 6.3.5 Utility Relocation Plan

It is anticipated that the review and approval process for Utility Relocation Plans may take three to six months. It is the Design-Builder's sole responsibility to mitigate any conflict or impact the Utility Relocation Plans approval process may have on the Design-Builder's Work schedule.

#### *6.3.5.1 Design by the Design-Builder*

If the Design-Builder and the Utility Owner agree that the Design-Builder shall furnish the design of the Utility Relocation Plan, 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 Relocation Plan, 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.

#### *6.3.5.2 Design by Utility Owner*

The Department will 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 Utility Relocation Plan information must meet the standard of quality necessary for the Utility Owner to construct the Utility Relocation. The Design-Builder shall provide all information necessary for the Utility Owners to create Utility 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 Utility Relocation Plan has resolved the conflicts identified in the Utility Conflict Map. The Design-Builder shall inform the Utility Owner in writing with a copy given to the Department.

### 6.3.6 Utility Plans

Upon completion of all Utilities Work, the Design-Builder will incorporate this information into Utility 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 as required by the Department's Standards. The Design-Builder will incorporate this information into its CADD drawings, and ultimately, on the Design-Builder's As-Built Documents.

## 6.4 Construction 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 entities with jurisdiction, and adjacent property owners).

### *6.4.1 Construction by the 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 encroachment 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 Caltrans'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 caution 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.

- MUA: The Design-Builder shall sign four originals and return all to the Department.
- The Department Utility Encroachment Permit Application: The Design-Builder shall submit one original with two sketches to the Department for Approval on all Utilities that are designed by the Design-Builder. Submittal shall be within two Days of the Design-Builder's receipt of the Utility's Design Approval Letter. The Department will respond within 10 Working Days of receipt.
- 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 | LADWP Standard Conditions for Construction |
| Exhibit 6-B | Utility Agency Contact List |
| Exhibit 6-C | Utility Tracking Report |

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 and/or temporary easement, necessary for the Project in accordance with the *Caltrans Right of Way Manual*. The R/W Appraisal / R/W 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 / R/W Maps also delineate permanent and/or temporary easements being acquired by the Department for Project. It is unanticipated that the Department will identify any additional R/W requirements.

The Design-Builder shall not enter into negotiations for purchase or lease of any property or property rights required to construct the Project. Design–Builder, at its sole cost, may negotiate directly for private property for temporary use that would facilitate the 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 for the Project but are for the sole benefit of the Design-Builder.

The Design-Builder has reviewed the R/W Appraisal / R/W Maps and understands schedule implications associated with the Department acquisition of property rights. 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 the Project. The Department will make a reasonable attempt to accommodate Design Builder's priority acquisitions.

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

Design-Builder will be provided access to parcels identified on the R/W Appraisal / R/W 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 Design-Builder periodic 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 Design-Builder of the availability of each required parcel and notify the Design-Builder of any access restrictions that may be applicable. Design-Builder shall not be allowed access to any parcel until said written notification is provided by the Department.

## 7.2 Administrative Requirements

The Design Builder shall comply with those administrative requirements that are applicable to Work performed by the Design Builder.

### *7.2.1 Standards*

The Design Builder shall perform grading analysis and design 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 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 unresolved ambiguity in standards, 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 Proposals (RFP) issue date unless modified by Addendum or Change Order. In the event of a conflict among the standards set forth in Book 3, relating to R/W activities, the order of precedence shall be as set forth below, unless otherwise specified.

**Right of Way Standards and Requirements**

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

Pursuant to Title 23, Code of Federal Regulation (CFR) §710.313(d)(1)(i), the Design-Builder shall comply with the procedures, guidelines, and standards set forth in the Department's 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 Department or Department personnel, the Design-Builder shall be responsible for conducting those activities unless otherwise stated in these Technical Provisions. 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*

Design-Builder shall:

- Conduct progress meetings with the Department, affected governmental entities, 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 by the Department.
- Participate in condemnation meetings as requested by the Department.
- 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 at least one day prior to scheduled meetings), and meeting minutes (sent to the Department within five Working Days of the meeting).

The Department will provide the Design-Builder notice not less than five Working Days of such meetings.

### *7.2.3 Software Requirements*

The Design Builder shall at its own discretion use any software when designing plans for approval but shall prepare the final drawings using MicroStation V8 as the drafting software with conversion to PDF available. All reports and documents shall be prepared in Microsoft Excel or Word format.

## 7.3 Resources Provided by Department

The department will provide the R/W Appraisal / R/W Maps (Exhibit 7-A) and Right of Way Status Chart (Exhibit 7-B).

## 7.4 [NOT USED ]

## 7.5 Acquisition Activities

### *7.5.1 Identification of Additional R/W Including Construction Easements*

If Design-Builder determines that additional R/W is necessary or required, 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. The request shall verify that any additional R/W sought is sufficient to construct the project. The request shall include drawings depicting proposed construction limits and cross-sections. The Department will review the request and will determine whether the acquisition is reasonable and necessary. Acceptance is, subject to, but not limited to conformance with the Environmental Document. The Department will notify the Design-Builder in writing if the request for additional R/W is acceptable or unacceptable and thus rejected.

If the request for additional R/W is accepted, 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 Design-Builder to certify the parcel(s) for access for the first 10 parcels and an additional 90 days for each additional parcel from the time of the written request. Schedule implications shall be incorporated into Design-Builder's schedule and the Department shall not be responsible for any construction delays resulting from the acquisition of such Additional R/W. Access to the Additional R/W will not be allowed until the Department has notified Design-Builder in writing that it is available for use.

A separate request to acquire Additional Property shall be prepared by the Design-Builder for each property. The request shall include:

- A drawing depicting the additional acquisition needed. The drawing shall be tied to the Project datum with sufficient information and accuracy necessary for mapping (e.g., stationing and offset or coordinates). The best available mapping shall be utilized for the drawing. The drawing shall be color coded to indicate the type of title needed (red for fee, green for easement)
- Name of owner
- Duration of need for property (permanent or length of temporary use);
- Type of property rights needed (fee, easement, etc.);
- Analysis regarding need to acquire the parcel (including analysis regarding alternatives to the acquisition);
- Value engineering analysis, if applicable; and
- Desired date for provision of access.

The Department will be responsible for payments to all property owners, except as directed elsewhere in this Section 7. The Design-Builder shall reimburse the Department for all costs associated with additional R/W acquisitions, including the cost of acquisition services, legal fees, and court costs, relocation assistance program costs, utility relocation costs, litigation guarantees, title insurance policy premiums, as well as the purchase price and closing costs. All costs of Design-Builder's activities in support of R/W Work shall be included in Design-Builder's Proposal.

The Department is responsible for providing a Certificate of Sufficiency (CoS), Hazardous Materials Disclosure Documents (HMDD), Hazardous Waste Assessment Memorandum, and R/W Appraisal / R/W Maps. The Department is responsible for obtaining any required California Transportation Commission (CTC) resolution, if necessary, due to the additional R/W acquisition.

If the Department identifies any additional R/W requirements the same schedule lead times would apply however the costs associated would not be charged to the Design-Builder.

#### *7.5.1.1 Early Access*

Where early access (rights of entry, permits for testing, or similar permissions) are requested by the Design-Builder for any additional property intended to be used temporarily or permanently, the Design-Builder may request in writing, that the Department negotiate with property owners or occupants, as applicable, 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 State of California and Federal Law (including Uniform Relocation Assistance and Real Property Acquisitions Policies Act of 1970, Public Law 91-646, as amended); may jeopardize Federal funding. The Design-Builder may use its own forces to negotiate temporary rights or permission to use properties outside the proposed Project R/W for its staging or storage purposes to complete the Project construction. In the event that the Design-Build's request for early access is approved in writing by the Department, such activities will be subject to the provision that the Department may withdraw from such activities at any time solely under its own discretion and shall be held harmless.

#### *7.5.1.2 Relocations*

The Design-Builder shall not interfere with the Department in the relocation of any occupants from any property within the planned R/W limits or from any additional property that the Department agrees to acquire, to avoid any negative impacts to the Project during relocation. Design-Builder shall not undertake any activities that are not in accordance with applicable State of California and Federal Law (including the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, as amended). Occupants of residences or businesses who have not yet moved from the right of way will be protected against any unnecessary inconvenience and disproportionate injury or any action coercive in nature. Any and all appeals for relocation assistance shall be heard by the Department in compliance with the Department policy and procedures and in compliance with guidelines set forth by the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, as amended.

### *7.5.2 Eminent Domain – Condemnation*

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

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

### *7.5.3 Property Management*

The Design-Builder is responsible for management of all Project R/W and improvements at the time the Department obtains possession of the R/W and gives written notice to the Design-Builder following Contract award. Following possession of the R/W and upon written notice from the Department to the Design-Builder; removal of named site improvements, including foundation removal of buildings and structures, may begin. Improvement removal, demolition, or salvage efforts by the Design-Builder must not delay or impede construction schedule agreed to by the Department and the Design-Builder.

The Design-Builder shall perform the following in compliance with the procedures set forth in the Department Right of Way Manual:

- Secure the R/W and improvements thereon against unauthorized entry.
- Place and replace as needed "No Trespassing" signs (as supplied by the Design-Builder or the Department) on the buildings and structures to be removed.
- Drain the pipes and water heater, if appropriate. Drain the water and fill any swimming pool(s) with dirt, if applicable.
- If buildings are possessed by the Department and not occupied; disconnect water, gas, and electric services and have the meters removed. If appropriate, bills for utilities properly payable by the Department, covering the period after the keys are turned over to the Design-Builder should be forwarded to the Department for payment. Utilities shall be capped if buildings are to be demolished.
- Submit a notice of vacancy and utility shut-off to the Department when the building is vacant and retain keys for the building. Keys shall be returned to the Department at the end of construction.
- Submit a written notice of vacant structures to the California Highway Patrol, local police department, and local fire department with copies submitted to the Department.
- Design-Builder shall maintain weed abatement and removal of dumping on the Project R/W during the construction period of the project.

Demolition is anticipated on two (2) parcels. In the event of unforeseen circumstances, requiring additional demolition the Department shall, notify the Design-Builder in writing of such additional demolition.

## 7.6 Deliverables

### *7.6.1 Acquisition Activities Deliverables Summary*

For acquisition of additional R/W and/or construction easements, the Department will provide a R/W Appraisal / R/W Maps for the Design Builder.

The Design Builder shall provide the following items related to Eminent Domain - Condemnation:

- All items necessary for justification of eminent domain actions
- Materials and exhibits for hearings or trials as required
- Expert witness for hearings or trials as required

For acquisition of additional R/W and/or construction easements, the Design Builder shall submit a written request to the Department.

# EXHIBIT 7-A

Right of Way Appraisal / Right of Way Maps

This exhibit is provided as an electronic file

# EXHIBIT 7-B

Right of Way Status Chart

This exhibit is provided as an electronic file.

# 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 under the requirements of the contract documents, and these Technical Provisions.

Design and construct the geotechnical work under requirements of these Technical Provisions, including performance requirements, standards and references, warranties, design and construction criteria, maintenance during construction, and required submittals.

Pre-contract 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 under 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 unless specified here or modified by Addendum or Change Order.

**Geotechnical Standards and Requirements**

| Priority | Agency | Title |
|---|---|---|
| 1 | Department | California Amendments to the AASHTO LRFD Bridge Design Specifications- 4th Edition |
| 2 | AASHTO | LRFD Bridge Design Specifications, 4th Edition |
| 3 | AASHTO | LRFD Bridge Design Specifications, 5th Edition only for Section 10.5.4 |
| 4 | Department | Seismic Design Criteria |
| 5 | Department | Division of Engineering Services (DES) Memo to Designers 3-1 Deep Foundations |
| 6 | Department | Division of Engineering Services (DES) Memo to Designers 5-20 Foundation Report / Geotechnical Design Report Checklist for Earth Retaining Systems |
| 7 | Department | Division of Engineering Services (DES) Memo to Designers 1-35 Foundation Recommendation and Reports |
| 8 | Department | Division of Engineering Services (DES) Memo to Designers 20-1 Seismic Design Methodology |
| 9 | Department | Division of Engineering Services (DES) Memo to Designers 4-1 Spread Footings |

| | | |
|---|---|---|
| 10 | Department | Division of Engineering Services (DES) Memo to Designers 20-10 Surface Fault Rupture Displacement Hazard Investigations |
| 11 | Department | Division of Engineering Services (DES) Memo to Designer 20-12 Site Seismicity for Existing and Temporary Bridges |
| 12 | Department | Special Provisions |
| 13 | Department | Standard Plans |
| 14 | Department | Design-Build Modifications to the Standard Specifications for Construction |
| 15 | Department | Standard Specifications |
| 16 | AASHTO | LRFD Bridge Construction Specifications |
| 17 | Department | Soil and Rock Logging, Classification, and Presentation Manual |
| 18 | Department | Guidelines for Preparing Geotechnical Design Reports |
| 19 | Department | Foundation Report Preparation for Bridge Foundations |
| 20 | Department | Geotechnical Manuals |
| 21 | Department | Bridge Construction Records and Procedures Manuals |
| 22 | ASTM | American Society of Testing and Materials (ASTM) Standards |
| 23 | AASHTO | Standard Specifications for Transportation Materials and Methods of Sampling and Testing |
| 24 | Department | California Test Methods (CTM) |
| 25 | Department | Independent Assurance Manual |

### *8.2.2 References*

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

**Geotechnical References**

| Agency | Title |
|---|---|
| Department | GS Procedure: Report Titles and Guidelines |
| Department | Code of Safe Practices for Geotechnical Drilling |
| 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 | The 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 LRFD Design Methods |
| FHWA | Drilled Shafts: Construction Procedures and Design Methods |
| NCHRP | Synthesis 360, Rock-Socketed Shafts for Highway Structure Foundations |
| API | Recommended Practice for Planning, Design, and Constructing Fixed Offshore Platforms – Working Stress Design |

### *8.2.3 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 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 and Log of Test Borings (LOTBs).

The Design-Builder shall at its own discretion use any software when preparing plans for approval but shall prepare final drawings in MicroStation V8 or the latest version available upon agreement from the Engineer.

### *8.2.5 Equipment Requirements*

Instrument for measuring vibrations must be capable of measuring, recording, and producing an electronic file and hardcopy printout of the frequency and peak particle velocity in three mutually perpendicular axes. Vector-sum instrument is not allowed. The instrument must also be capable of measuring and recording the frequency and displacement of each vibration event.

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

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

### *8.2.6 Personnel Requirements*

Provide a geotechnical team that includes, at a minimum, one Professional Engineer (with both Civil and Geotechnical Engineer Licenses) and one Certified Engineering Geologist, both licensed in the State of California. The team leader must be a Professional Engineer (with both Civil and Geotechnical Engineer Licenses) licensed in the State of California and the qualifications are specified in Book 2 Section 2.5.

### *8.2.7 Certification Requirements*

Perform all laboratory tests and testing equipment calibration at AMRL-accredited facilities for the geotechnical tests and equipment calibration required by this section.

## 8.3 Design Requirements

### *8.3.1 Geotechnical Execution Plan*

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

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

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

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

Submit the draft GEP for review. Schedule a meeting, within ten (10) days of the submittal of the draft GEP to present the geotechnical concept, the geotechnical needs of the Project, the draft Geotechnical Execution Plan, and the meeting schedule.

Submit Final Geotechnical Execution Plan for review and record.

### *8.3.2 Geotechnical Subsurface Information*

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

For bridge foundation design, perform borings and/or CPTs at each bridge support location if no reliable and applicable bore holes or CPTs information at the support location are available.

### *8.3.3 Geotechnical Subsurface Exploration*

#### 8.3.3.1 Drilling

Drilling for subsurface exploration must comply with ASTM Standards.

#### 8.3.3.2 Cone Penetration Test

Cone Penetration Test (CPT) must comply with ASTM D5778. CPT data must include raw and corrected tip resistance, side friction, and excess pore water pressure if groundwater is present. This data must be collected electronically and presented in graphical format that includes an interpretation of the soil behavior type index and soil behavior type.

#### 8.3.3.3 Geotechnical In-Situ Test, Instrumentation and Geophysical Exploration

Install geotechnical instruments to monitor and record integrity of excavated face of soil nail wall and ground anchor wall during construction and displacements of the walls after construction.

Install geotechnical instruments as necessary in accordance with required ASTM/CTM and the requirements of FR/GDR guidelines. Replace or recalibrate instruments that are damaged during construction within 5 working days.

Geotechnical in-situ test, geophysical exploration, and geotechnical instruments installation must comply with ASTM/CTM and the requirements of FR/GDR guidelines.

Driven Pile:

For pile diameter between 18 inches and 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 10 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 under 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.

Drilled Pile:

Test drilled piles shall follow the criteria in the CA Amendments to the AASHTO LRFD Bridge Design Specifications

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.

Provide the pile load test program, construction and pile load test specifications to Department for review and approval 21 days prior to performing pile load test. Test pile installation techniques must reflect the method to be used for the production pile. The test pile and pile load test shall be completed and accepted by the Department before construction of any production piles.

#### 8.3.3.4 Borehole Site Cleanup

Backfill borehole, after drilling or CPT sounding, with a cement bentonite grout mix or bentonite hole plug, and asphalt or concrete to match existing pavement if borehole is at pavement. Record the activity and materials in borehole backfill datasheet.

#### 8.3.3.5 Geotechnical Laboratory Test

Geotechnical laboratory test must comply with California Test Methods (CTM), and ASTM if there is no applicable CTM.

#### 8.3.3.6 Sample Retention and Transfer

Submit obtained rock samples to Department Lab after required tests and analyses are completed. Department will keep these samples until at least completion of Project.

### *8.3.4 Geotechnical Reports*

Prepare Geotechnical Design Reports (GDRs) and Foundation Reports (FRs). Prepare separate Foundation Reports for each bridge when replacement, retrofit, or modifications to existing bridges are to be constructed.

Submit Geotechnical Design Reports, Foundation Reports, addenda, and revisions under requirements in Section 8.5. Sign and seal the reports by the Geotechnical Engineer who performed the work on the reports, who must be a licensed Geotechnical Engineer in the State of California.

The Department will notify the Design-Builder receipt of each Geotechnical report. The construction of subject structure, slope, or embankment, must not be started until the Design-Builder receives a notice of Released for Construction. If such work is performed before such notice is provided, it must be at the sole risk of the Design-Builder.

### *8.3.5 Settlement Criteria for Earth Retaining Systems*

Retaining walls should be designed for both Bearing Capacity and Settlement. The Differential Settlement for MSE systems shall be less than 0.5% and for Cantilever, Gravity walls shall be less than 0.2%.

## 8.4 Construction Requirements

### *8.4.1 Piling*

Pile-tip grouting is not allowed to account for drilled-shaft (CIDH) tip resistance unless the Design-Builder provide a testing protocol and test results Approved by the Department.

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

### *8.4.2 Soil Nail Wall Requirements*

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

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

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 shall not be 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 by the Design-Builder.

## 8.5 Deliverables

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

### *8.5.1 Geotechnical Subsurface Information*

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

Subsurface information must be recorded and reported under the following requirements:

- 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
    - Final Borehole Log or Borehole Record of each bore hole performed
    - 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
    - Borehole backfill datasheet
- 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 and interpretation report
- Laboratory Test
    - Results of laboratory tests performed
- Survey data of borehole, 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, and comply with Caltrans "Soil and Rock Logging, Classification, and Presentation Manual", Geotechnical Services "Guidelines for Preparing Geotechnical Design Reports", "Caltrans Guidelines for Structures Foundation Reports", and "Foundation Report Preparation for Bridge Foundations".

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

# EXHIBIT 8-A

Log of Test Borings

This exhibit is provided as an electronic file.

# 9 LAND SURVEYING

## 9.1 General

The Design-Builder shall perform all Work necessary to meet the requirements associated with land surveying, including project and supplemental horizontal and vertical control surveys, subsequent mapping and topographic surveys, bridge-site surveys, utility surveys, soils surveys, construction surveys, as-built surveys, and all other land surveying services necessary to complete the Project in an accurate, neat, and timely fashion. This Work shall not include primary horizontal and vertical control surveys, right-of-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 provide primary horizontal and vertical control points (minimum of two horizontal and one vertical), existing 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 Standards*

The Design-Builder shall perform the land surveying Work in accordance with the latest editions of manuals and documents listed in Book 3. In the event of a conflict among the standards set forth in Book 3, the order of precedence shall be as set forth below, unless noted otherwise:

| **Agency** | **Title** |
|---|---|
| Department | *Surveys Manual* |
| Department | *Standard Specifications** |
| Department | Standard Plans |
| Department | *Safety Manual* |
| Department | *Plans Preparation Manual* |
| Department | *CADD Drafting Standards* |
| Department | *CADD Users Manual* |
| Federal Geographic Data Committee (FGDC) | *FGDC Geospatial Standards* |

*Document modified for design-build

### *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 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 Working 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 State of California Professional Land Surveyor license, or a valid State of California Registered Civil Engineer license authorized to practice land surveying in the State of California. The Survey Manager shall 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 an authorized 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. 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 land surveying data relevant to the Project, which may include the following items:

- The location and coordinate values of the available horizontal and vertical control stations within the Project.
- Existing centerline roadway alignments.
- Photogrammetric mapping.
- Right-of-way 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 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*.

### 9.3.1.2 Survey Control Datum

The horizontal survey datum used for the Project shall be the California Coordinate System of 1983 (CCS83), Zone 5 Coordinates 1991.35 EPOCH as described in the Public Resources Code, Sections 8801 et. Seq. The vertical survey datum shall be the National Geodetic Vertical Datum of 1988 (NAVD 88) M.L.L.W. 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 be responsible for the preservation and perpetuation of all existing monuments which control subdivisions, tracts, boundaries or rights-of-way, or which provide survey control, including benchmarks, disturbed by the Contractor's activities within the Project limits, in accordance with Section 8771 of the Business and Professions Code.

## *9.3.3 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 Surveys and Photogrammetric Mapping for Design

This shall include location surveys. Location surveys are not intended to be all-inclusive, but rather to cover design surveys commonly encountered.

### 9.3.3.2 Photogrammetric Maps and Products

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

### 9.3.3.3 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.

The Design-Builder shall submit copies of stakeout reports, calculations, and layout data to the Department as requested, upon completion of survey field Work for all portions of the Work that are staked for line and grade; and provide copies of as-built grade sheets. Corresponding cut or fill volumes to finished grade (or flowline) shall be indicated on the grade sheets.

All 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 valid State of California Professional Land Surveyor license, or a valid State of California Registered Civil Engineer license authorized to practice land surveying in the State of California.

### *9.3.5 As-Builts*

The Design-Builder shall prepare a certified as-built survey drawing based upon field observations provided by a valid State of California Professional Land Surveyor license, or a valid State of California Registered Civil Engineer license authorized to practice land surveying in the State of California ,and his or her agents, illustrating dimensions, locations, and elevations of construction, and site Work. Upon completion of each phase of construction or major site improvements, the Design-Builder shall submit the certified as-built survey drawing to the Department review and Acceptance. The Design-Builder shall provide the field observed survey data in hardcopy format, including a plot of the survey data and tabular data, and an electronic file compatible with Caltrans CADD Drafting Standard.

#### 9.3.5.1 Survey Base Map

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

- Utilities – Structures and related items above and below the ground that are part of the power, water, sewer sanitary), natural gas, telephone, communications, and pipeline systems within the Project.
- Drainage – Structures and related items above and below the ground that are part of the storm drain systems within the Project.
- Alignment – The location of the in-place roadway and railroad alignments 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, drainage, property information, centerline alignments, and survey control items.

## 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

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 and electronic formats, as appropriate, at the completion of each activity (i.e., electronic measurement raw data should only be provided in electronic format). Electronic data submitted shall be compatible with the latest Caltrans CADD Drafting Standards software and operating

systems. As applicable; electronic data shall be in MicroStation file format (.DGN) along with an ASCII file including point number, northing, easting, elevation. 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.

Final Acceptance for the survey portion of the Work will not be given until all deliverables have been submitted and Accepted by the Department. The Department will have 10 Calendar Days to complete its compliance review of the Design-Builder's submitted Project deliverables.

| **Deliverable** | **For Acceptance or Approval** | **Number of Copies** | | **Submittal Schedule** | **Reference Section** |
|---|---|---|---|---|---|
| | | **Hardcopy** | **Electronic** | | |
| Survey Records | Acceptance | 1 | 1 | Substantial Completion | 9.3.4 |
| Survey Reports | Acceptance | 1 | 1 | Upon completion of each survey | 9.3.4 |
| As-Builts | Acceptance | 1 | 1 | Upon completion of each phase of construction or major site improvements | 9.3.5 |
| Survey Base Map | Acceptance | NA | 1 | within 30 Working Days of Substantial Completion of the Project | 9.3.5.1 |

# 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 and the standards below.

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

The Design-Builder shall coordinate with all 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.

## 10.2 Administrative Requirements

### *10.2.1 Standards*

The Design-Builder shall perform grading analysis and design in accordance with the requirements of the standards listed by priority below. each listed standard as of the initial Publication Date of these Instructions to Proposers (ITP) unless specified herein or modified by Addendum or Change Order."

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 specified herein or modified by Addendum or Change Order.

**Grading Standards and Requirements**

| Priority | Agency | Title |
|---|---|---|
| 1 | Department | Highway Design Manual (HDM) |
| 2 | Department | Standard Special Provisions |
| 3 | Department | Standard Plans |
| 4 | Department | Design Build Modifications to the Standard Specifications for Construction |
| 5 | Department | Standard Specifications |
| 6 | Various | Technical Memoranda |
| 7 | Department | Plans Preparation Manual |
| 8 | Department | CADD Users Manual |

### *10.2.2 References*

Use the references listed below as supplementary guidelines for the grading analysis and design.

**Grading Publication References**

| Agency | Title |
|---|---|
| Department | Construction Manual |
| Department | California Test Methods |
| Department | Ready-To-List and Construction Contract Award Guide (RTL Guide) |

### *10.2.3 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.

### *10.2.4 Software Requirements*

The Design-Builder shall at its own discretion use any software when designing plans for approval but shall prepare the final drawings using MicroStation V8 as the drafting software.

### *10.2.5 Meetings*

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

### *10.2.6 Certification Requirements*

The Design-Builder shall perform all laboratory testing at a the 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.

### *10.2.7 Coordination with Other Agencies and Disciplines*

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

## 10.3 Design Requirements

### *10.3.1 Grading Concept Meeting*

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

### *10.3.2 Grading Requirements*

The Design-Builder shall provide grading plans and shall be responsible for ensuring that the final grading is consistent with all Contract requirements, including environmental, landscape, and National Pollutant Discharge Elimination System (NPDES), roadway design, and geotechnical requirements. This may include special features such as retaining walls, special fills, etc., as per the approved Release For Construction Documents. Erosion control and Site protection treatments shall be provided by the Design-Builder for all areas where grading is performed.

The Design-Builder shall prepare a Disposal Site Plan and submit for Approval.

## 10.4 Construction Requirements

### *10.4.1 Requirements*

The Design-Builder shall suspend all excavation and grading activities when winds exceed 20 miles per hour.

Mining of material within the Right-of-Way will not be allowed without prior Department Approval. If the Design-Builder elects to request Approval to mine within the right of way, the Design-Builder must develop, implement, and maintain a Mining Plan. The mining plan shall address site restoration, environmental impacts, material management, and other pertinent information. The Mining Plan shall be submitted for Approval.

The use of mining aggregates and materials is regulated under the Surface Mining and Reclamation Act (SMARA). Details of the permitted use of such materials can be found at

http://www.consrv.ca.gov/omr/smara/

The Design-Builder shall prepare a Solid Waste Disposal and Recycling Report. Refer to the Engineering Documents for the applicable form. Aggregates sources shall be identified and submitted for approval prior to usage.

### *10.4.2 Removal of Miscellaneous Objects*

The Design-Builder shall remove and properly dispose of all objects encountered within the project 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 the Department Right of Way is not allowed, unless disposed of as stated in the Caltrans Standard Specifications.

### *10.4.4 Removal of Pavement and Sidewalks*

The Design-Builder shall obliterate existing surfacing when no longer required for the passage of public traffic within the Project limits. Any additional work outside the project limits will be paid for as a Directed Change if the conditions in Article 9 of the Design Build Contract are satisfied. When removing such items, the Design-Builder shall saw cut the pavement or sidewalk with neat lines at the removal terminations.

## 10.5 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.

### *10.5.1 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.

### *10.5.2 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. Approval for all RFC Documents is required.

### *10.5.3 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
- Shop Drawings
- Design calculations
- Reports/Project documentation
- Specifications and Special Provisions

### *10.5.4 Design Justification Reports and Project Documentation*

Upon request, the Design-Builder shall submit design justifications when the Design-Builder shall consider various factors or alternatives. Documentation may be computer generated or hand written and shall clearly identify the following:

- Design issue
- Items requiring consideration
- Basis for evaluation
- Final decision and justification

The Design-Builder shall prepare and submit bound design calculations and Project documentation. These submittals shall be in indexed paper or electronic format, organized by design topic.

### *10.5.5 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.

### *10.5.6 Mining Plan*

If the Design-Builder intends to perform any mining within the Department R/W, the Design-Builder shall submit a Mining Plan for Approval and must receive Approval before mining any material within the Department R/W. The Design-Builder will receive a response within 15 calendar Days of receipt of the plan.

### *10.5.7 Disposal Site Plan*

The Design-Builder shall submit a Disposal Site Plan for Approval and must receive Approval before disposing of any surplus excavated material on the Department R/W. The Design-Builder will receive a response within 15 calendar Days of receipt of the plan.

The Design-Builder must submit the approved "Solid Waste Disposal and Recycling Reports" no later than February 1$^{st}$ of each year or within 15 days after receiving the final report.

### *10.5.8 Grading Plans*

Upon completion of all grading activities, the Design-Builder shall generate a complete set of grading plans for the entire project limits.

### *10.5.9 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 requirements of Final Design Documents.

# 11 ROADWAYS

## 11.1 General

The Design-Builder shall perform all Work necessary to meet the requirements associated with Roadways in accordance with the requirements of the Contract Documents and these Technical Provisions. Roadway classifications include mainline (I-10 & I-605), connector ramps, city streets and private driveways.

The Design-Builder shall coordinate with all 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.

## 11.2 Administrative Requirements

### *11.2.1 Standards*

The Design-Builder shall perform the Roadway 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 modified by Addendum or Change Order.

**Roadway Standards and Requirements**

| Priority | Agency | Title |
|---|---|---|
| 1 | Department | Highway Design Manual (HDM) |
| 2 | AASHTO | Policy on Geometric Design of Highway and Streets |
| 3 | Department | Standard Special Provisions |
| 4 | Department | Standard Plans |
| 5 | Department | Design Build Modifications to the Standard Specifications for Construction |
| 6 | Department | Standard Specifications |
| 7 | TRB | Highway Capacity Manual |
| 8 | AASHTO | Roadside Design Guide |
| 9 | Department | Project Development Procedure Manual |
| 10 | Various | Technical Memoranda |
| 11 | USDOT | Record of Decision (ROD) |
| 12 | Department | Final Environmental Impact Report (EIR)/Environmental Impact Statement (EIS) |

| | | |
|---|---|---|
| 13 | Department | Storm Water Pollution Prevention Plan (SWPPP) and Water Pollution Control Program (WPCP) Preparation Manual |
| 14 | Department | Plans Preparation Manual |
| 15 | Department | CADD Users Manual |

### *11.2.2 References*

Use the references listed below as supplementary guidelines for the design and construction the roadway and freeway system as appropriate.

**Roadway References**

| **Agency** | **Title** |
|---|---|
| Department | Ready to List and Construction Contract Award Guide (RTL Guide) |
| Department | I-605/I-10 Project Report |
| FHWA | National Cooperative Highway Research Program (NCHRP) Report-350 Recommended Procedures for the Safety Performance Evaluation of Highway Features |

### *11.2.3 Local Road System*

The Design-Builder shall design and construct all local streets and infrastructure improvements in accordance with the applicable City of Baldwin Park standards, specifications and requirements within these technical provisions.

Obtain all necessary approvals for design elements outside the Department planned Right-of-Way Limits as shown on the Preliminary Engineering Plans, as well as for any facilities to be owned or maintained locally. Coordinate with the local governing agencies as appropriate.

### *11.2.4 Preliminary Engineering Documents*

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

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

### *11.2.5 Software Requirements*

The Design Builder shall at its own discretion use any software when designing plans for approval but shall prepare the final drawings using MicroStation V8 as the drafting software with conversion to PDF available. All reports and documents shall be prepared in Microsoft Excel or Word format.

The Design-Builder shall use AutoTurn by Transoft Solutions.

### *11.2.6 Meetings*

The Department, the City of Baldwin Park, 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 attendees within five (5) days.

### *11.2.7 Coordination with Other Agencies and Disciplines*

The Department will assist in the coordination and resolution of all roadway 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. The Design-Builder is responsible for solving all issues with such agencies.

### *11.2.8 Certification Requirements*

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

## 11.3 Design Requirements

### *11.3.1 Roadway Concept Meeting*

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

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

### *11.3.2 Design Standards*

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

- Meet all Department and AASHTO roadway design and safety standards
- Meet capacity for all 2035 traffic volumes
- Meet all future improvements identified as the "preferred alternative" in the environmental document
- Meet the widths of all cross streets as shown in the Preliminary Engineering Documents

The scope of improvements shown in the Preliminary Engineering Documents reflects the preferred alternative described in the Final EIR/EIS and approved in the ROD. This preliminary design was used to establish the right of way limits. The Design-Builder shall obtain the Department approval for any design changes that extend beyond the right of way limits or exceed the impacts of the preferred alternative.

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

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. The 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. Coordinate the design of these elements with the Department and affected local agencies.

The Design-Builder shall prepare all necessary engineering studies and applicable design reports to justify and substantiate 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 perform all engineering, studies, documentation, and coordination required for the approval of the temporary connections.

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

The Preliminary Engineering Plans show typical sections for the mainline (I-10 & I-605) and the connector ramps freeway system throughout the Project limits. These include the number of lanes, shoulders, medians, and other cross section elements. The number and location of lanes in each direction on mainline and connector ramps shall be consistent with the Preliminary Engineering Plans. The Design-Builder shall extend all layers of the pavement section for the entire width of all shoulders. The pavement includes the roadway pavement for mainlines, connector ramps and all required improvements to local streets.

Deviations may be made within the framework of these design requirements to meet the requirements of a particular problem. However, any deviation, discrepancy, or unusual solution requires Approval before it can be included in the design. It is the responsibility of the Design-Builder to identify, explain, and justify any deviation from the established criteria and to secure the necessary authorization.

# PROJECT-SPECIFIC DESIGN STANDARDS

Roadway: I-S/B 605 to I-E/B 10 Connector Construction

Location: I-605/I-10 Interchange

| | |
|---|---|
| **Design Standards** | Connector |
| **Jurisdictional System** | Department |
| **Functional Class** | Freeway |
| **Access Control** | Full |
| **Highway Type** | Single-Lane Connectors |
| **Design Vehicle** | STAA |
| **Terrain** | Urban Areas |
| **Traffic Volumes**<br>**AADT**<br>**Year 2005** | See Final EIR/EIS |
| **Traffic Volumes**<br>**Projected AADT**<br>**Year 2035** | See Final EIR/EIS |
| **Projected Posted Speed** | 50 mph |
| **Proposed Design Speed** | 50 mph |
| **Shoulder Bus Use** | No |
| **Barrier Type** | Concrete Barrier |
| **Special Features:** | |

***Clear Zones for Local Roadways (County, City Facilities)***

On local roadways, the Design-Builder shall meet the clear zone/recovery area requirements in accordance with the City of Baldwin Park/Los Angeles County specifications and requirements section in the technical provisions.

### *11.3.2.2 Slopes*

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

### *11.3.2.3 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 (RFC) 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. 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, the Standard Plans, Revised and New Standard Plans, for appropriate safety devices.

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

### *11.3.2.4 Retaining Walls and Sound Walls*

The Design-Builder shall construct retaining walls in accordance with the Caltrans Highway Design Manual. Sound walls shall be constructed according to the recommendations provided in the I-10/I-605 Direct Connector Project Noise Study Report and in the Final EIR/EIS.

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

### *11.3.2.5 Pedestrian Ramps*

The Design-Builder shall meet the requirements in accordance with the Pedestrian Accessibility Guidelines for Highway Projects (Design Information Bulletin 82-03).

On local roadways, the Design-Builder shall design and construct pedestrian ramps in accordance with the applicable City of Baldwin Park or Los Angeles County standards, specifications and requirements within these technical provisions.

### *11.3.2.6 Fencing*

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

The Design-Builder shall provide gates where existing gates are in place and at all other locations where needed to provide maintenance vehicular access to any point on the right of way.

#### *11.3.2.7 Clearing and Grubbing*

Clearing and grubbing Work shall not start without an Approved Storm Water Pollution Prevention Plan (SWPPP) and a Traffic Management Plan (TMP). Refer to Environmental section and Maintenance of Traffic section, respectively, in these Technical Provisions.

#### *11.3.2.8 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 are not limited to, the information described below:

- Horizontal and vertical alignment
- Typical sections
- Related elements of the drainage system
- 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
- Transportation Management Plan (TMP)

#### *11.3.2.9 Visual Quality*

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

### *11.3.3 Design Exceptions*

The Department has approved various design exceptions, 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. The Design-Builder shall meet or exceed all mitigation commitments listed in the forms. The Department discourages increasing the magnitude of the existing approved exceptions, and will not consider exceptions for modest benefits.

Obtain the Department approval of any changes to the design standards or criteria. Fully and clearly document any changes from the Caltrans design standards and criteria and maintain a complete record of all such changes for the Department reference.

#### *11.3.3.1 Mandatory Design Exceptions*

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

The Design-Builder shall design all the elements associated with mainline, connector ramps and other roadways in accordance with the criteria established in the Engineering Documents section (ED). Some elements of the design developed in the preliminary design may not meet these design requirements. For

these variances, mandatory design exceptions have already been approved by the Department and FHWA and are described below.

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

The design exception request shall be submitted to the Department Reviewer for their review and approval. Design Reviewers will be available on the third week of each month. Once approved, the Department will forward the exception request to FHWA for Approval on the 13 controlling criteria if required (See Index 108.3 of the Caltrans Highway Design Manual). Typically, multiple submittals and reviews should be expected for the same design exception and this process could take approximately three (3) to six (6) months.

The Fact Sheet Exceptions to Mandatory Design Standards had been approved on September 6, 2006 (See Exhibit A). 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 might 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 five (5) Mandatory Design Exceptions have been approved:

- Design Exception #1 – Shoulder Width (HDM Index 302.1)
- Design Exception #2 - Minimum Clearance (HDM Index 309.1(3))
- Design Exception #3 - Spacing (HDM Index 501.3)
- Design Exception #4 – Lane Width (HDM Index 301.1)
- Design Exception #5– Stopping Sight Distance (HDM Index 201.1)

#### *11.3.3.2 Advisory Design Exceptions*

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

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

The Design-Builder is discouraged from creating additional advisory design exceptions, since there is no assurance that Department will approve them; however, elimination of existing design exceptions by the Design-Builder is encouraged. If the Design-Builder's design creates additional design exceptions, the Design-Builder must demonstrate on a case-by-case basis that substantial benefits to the Project and the public would result from the Design-Builder's recommendation. Any additional exceptions requested by the Design-Builder will be subject to Department approval. The format and requirements of the Advisory Design Exceptions shall follow the format and requirements of the Mandatory Design Exceptions as stated in Chapter 21 of the Project Development Procedures Manual (PDPM) with the exception that the Advisory

Design Exceptions only need Department District 7 Approval. The Geometrician and FHWA approval are not necessary for an Advisory Design Exception.

Upon receipt of the design exception request, Department will review and if deemed acceptable, approve the request. Typically, multiple submittals and reviews should be expected for the same design exception and this process could take approximately two (2) to four (4) months.

The Fact Sheet Exceptions to Advisory Design Standards had been approved on March 25, 2009 (See Exhibit B). 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 might 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 three (3) Advisory Design Exceptions have been approved

- Advisory Design Exception #1 – Grades (HDM Index 504.4(3))
- Advisory Design Exception #2 – Design Speed (HDM Index 504.4(2))
- Advisory Design Exception #3 – Single-Lane Connections (HDM Index 504.4(5))

### *11.3.3 Interchange Types*

If the Design-Builder elects to use a different type of interchange, the Design-Builder shall first obtain approval.

### *11.3.4 Interstate Route Continuity*

The Design-Builder shall not design left-side ramps, either entrance or exit, into the Project.

## 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 Plans and Documents in accordance with the requirements of this section.

### *11.5.1 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 a format acceptable and organized to facilitate review.

### *11.5.2 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 and Caltrans Plan Preparation Manual and the Design Quality Management Plan before construction may begin. Approval for Roadway RFC Documents is required.

The following list of RFC plans shall include, but not limited to, be produced. This list is not intended to be all-inclusive:

- Title sheet
- General layout sheets
- List of standard plans
- Earthwork tabulation and summary
- Typical sections
- Alignment plan
- Roadway/intersection plans
- Roadway profiles
- Superelevation plans
- Construction Detail Plan
- Contour Grading Plan
- Drainage Plans, Profile and Details
- Utility Plans
- Stage Construction and Traffic Handling Plan
- Detour Plans
- Construction Area Signs Plan
- Pavement Delineation Plans
- Retaining Wall Plans, Details and Quantities
- Sound Wall Plans, Details and Quantities
- Planting and Irrigation Plans, Details and Quantities
- Signals, Lighting and Electrical Systems Plan
- Roadway cross-sections
- Structure Plans
- Standard Specifications and special provisions

### *11.5.3 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
- Reports/Project documentation

- Specifications and Special Provisions

### *11.5.3.1 Plans*

Plans shall, at a minimum, include the following:

***General Requirements (All Sheets)***

- District, County, Route, Post Mile Total Project, Contract Number
- Name and signature of Registered Civil Engineer preparing plan
- Roadways labeled
- Scale, north arrow, legend
- References to other sheets (i.e., See Sheet No. xx, or Match Line See Sheet 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
- File name, plot name, and date and time of plot at lower left

Complies with Caltrans CADD Data Standards (i.e., level, line style, line weight, text size, cells, etc.) and the Caltrans Plans Preparation Manual

***Title Sheet***

- Show: necessary station equations (only for the alignment that the length is based on); Strip map of the project, a small-scale State Map (location map on the sheet format) index of the plan sheets. The signature and registration seal of the person in responsible charge for preparation of the entire project, mandatory material or disposal sites (if any), and contract number
- Provide: signature block with appropriate signature lines; project description; limits of construction and work north arrow and graphical scale (if applicable)
- Label: counties; cities; bridges; county roads referred to as such (not just as city street names)

***General Layout***

- Show: locations of plan-view sheets (construction, paving, intersections, drainage); existing roadways; bodies of water; existing land features/topography; noise walls, sound walls, retaining walls, bridge structures; existing and proposed fence data (types, locations, details, and gates)
- Label: proposed and existing roadways; bodies of water; cities; plan sheets; sound walls; retaining walls; bridge structures; alignment names; stationing; beginning and end of alignments; cut and fill lines; R/W boundaries
- Provide: alignment and curve data ($\Delta$, radius, tangent length, curve length); station equations

***Standard Plans***

- Provide: list of Caltrans Standard Plan Sheets used on the Project
- Any revision to a Standard Plan shall only be done by the Standard Plan owner. Specific details needed for which there are no Standard Plans shall be included as construction details.

- Standard plans dated May 2006 and the 2006 Revised Standard Plans and New Standard Plans shall be used.

***Typical Sections***

- Show: proposed and existing finished surfaces; grading sections; pavement and backfill structure; R/W, subsurface drainage, and slope rounding
- Label: roadway centerlines; profile grade; grading grade; existing ground; slopes; curbs; barriers; station limits below each section (sections with smallest stationing limits at bottom of sheet with increasing station sections stacked above); design designation in accordance to Section 103.1 of the HDM
- Dimension: existing and proposed roadway dimensions; dimensions to R/W

***Construction Detail Plans***

- Note(s) referring to details
- Label: alignments; curb types; pedestrian ramps; medians; traffic arrows; locations of standard plans used; walls; bridges; existing features; environmentally sensitive areas; R/W and easements; construction limits, curb radius centers and tangent points; gutter grades and spot elevations, if applicable
- Dimension: roadway; shoulder; paths/walks; tapers; intersection radii

***Profiles***

- Provide: vertical control note indicating datum and benchmarks, earthwork quantities, original ground line
- Label: grades; PIs, BVCs, and EVCs information; equations; paving notches; design speed met; high and low points; beginning and end points; tie-in points; intersections with other alignments; profile grade; grading grade; ditch grades; existing ground line; bridges; major intersected streets; railroads; streams
- Dimension: subgrade excavation depth and tapers

***Superelevation Plans***

- Show: superelevation transition diagram of crown slopes, and superelevations of the pavement and shoulders, and, if needed, superelevation profile diagrams; axis of rotation (0% line); stationing,
- Label: alignments; walls; bridges, superelevation in percent; curve points; stationing of Point of Intersections (PI's), Begin Vertical Curves (BVCs), and End Vertical Curves (EVCs)

***Contour Grading Plans***

- Show: Roadways with centerline stationing; existing and proposed grading; contour lines
- Label: Index contour elevations

***Drainage Plans, Profiles, Details and Quantities***

- Show: Layout and location of drainage facilities.
- Label: Size, Type and Location for each drainage facility; drainage system by number; assigned unit for each element of the system
- Drainage system numbering and unit designation shall correspond with those shown on the Drainage Profiles, Drainage Details and Drainage Quantities.

***Utility Plans, Profiles, Details and Quantities***

- Show: Existing and final location of utility; High risk utilities must be shown in accordance with "Policy on High and Low Risk Underground Facilities within Highway Rights of Way (refer to Appendix LL in PDPM)

***Stage Construction and Traffic Handling Plan and Detours***

- Provide: Alignment; profiles; typical cross sections to construct temporary roadways in stage sequence shown
- Show: Sequence of operation, work to be performed, materials to be used, and the traveled way to be used for all movements of traffic during each construction sequence; corresponding symbols and legend for each stage

Label: Alignments; existing roadbeds; traffic direction; number of lanes available for stage shown, pavement delineation

***Construction Area Signs***

- Provide: Temporary signs required for the direction of public traffic; sign details for special construction area signs
- Show: Construction area sign quantities in tabular format; sign code number; size of panel,

***Pavement Delineation Plans, Details, and Quantities***

- Provide: Summary of quantities for lines, pavement markings, pavement markers, delineators, channelizers,
- Show: limits and detail number for final traffic lines; pavement markings; pavement markers;

***Summary of Quantities***

- Provide: Summary of quantities in tabular format; line and station for easy location on plans

***Sign Plans, Details and Quantities***

- Show: Existing and proposed roadside signs; existing and proposed overhead signs; quantities in tabular format
- Label: Signs with a number (corresponding to sign plan, details and quantities)

***Retaining Wall Plans, Details and Quantities***

- Provide: Plan view of retaining system; typical section; quantities; Log of Test Boring (LOTB); aesthetic features
- Show: Layout line; width of footing, elevation view (showing top of wall and footing elevation, expansion joint, weep holes, weakened plane); gutter; finished grade; original ground

***Sound Wall Plans, Details and Quantities***

- Provide: Horizontal alignment; typical section; LOTB; aesthetic features
- Show: elevation view (showing top of wall, top of footing, bottom of footing, finished grade; expansion joint, location of access gate.)

***Planting and Irrigation Plans, Details, and Quantities***

- Show Planting and irrigation layouts, details and quantities (Refer to HDM for standards and guidelines)

***Signals, Lighting, and Electrical Systems (ES)***

- Refer to Section 86 of the Standard Specifications and the "ES" series of Standard Plans for type of work to be included.

***Fencing Plans***

- Label: Stationing; walls; Bridges; existing Railroads; lakes and rivers; environmentally sensitive areas; R/W and easements; fence data (types, locations, details, and gates); coordinate grid ticks and labels (minimum of three per sheet)
- Dimension: R/W to fence

***Cross Sections***

- Show: Existing and proposed utilities; existing and proposed Right of Way and easements
- Provide: 1-inch grid

Plans listed above are not an all inclusive list. Refer to the Plans Preparation Manual for a complete list and their requirements.

### *11.5.3.2 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 it has been approved. Any deviations from approved shop drawings shall require that the Design-Builder re-submit revised shop drawings for approval.

### *11.5.3.3 Design Calculations*

- Design calculations shall include, but not limited to, the information described below.
- Horizontal sight distance (Intersections, all Roads, and mainline)
- Vertical sight distance: stopping, decision sight distance, and passing (if applicable) for all Roads
- Intersection geometrics (vehicle turning movements)
- Clear zones
- Superelevation
- Traffic barrier, end treatments, and impact attenuators
- Retaining Wall
- Sound Wall
- Earthwork
- Structures

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.

#### *11.5.3.4 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

#### *11.5.3.5 Non- Standard Specifications and Special Provisions*

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

### *11.5.4 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 (dgn files) The As-Built Documents shall meet the format and content requirements of Final Design Documents.

# EXHIBIT 11-A

Fact Sheet Exceptions to Mandatory Design Standards

This exhibit is provided as an electronic file.

# EXHIBIT 11-B

Fact Sheet Exceptions to Advisory Design Standards

This exhibit is provided as an electronic file.

# 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, and closed storm drain systems.

## 12.2 Administrative Requirements

### *12.2.1 Standards*

The Design-Builder shall perform the drainage work in accordance with the latest editions of manuals and documents listed in Book 3. In the event of a conflict among the standards set forth in Book 3, the order of precedence shall be as set forth below, unless noted otherwise:

| **Agency** | **Title** |
|---|---|
| Department | *Highway Design Manual* |
| Department | *Bridge Design Specifications (LFD Version, April 2000)* |
| Department | Bridge Design Aids |
| Department | Bridge Design Details |
| Department | *Bridge Design Practice* |
| Department | Standard Special Provisions |
| Department | Standard Specifications |
| Department | Standard Plans |
| Department | *Project Planning and Design Guide (PPDG)* |
| Department | *Storm Water Pollution Prevention Plan (SWPPP) and Water Pollution Control Program (WPCP) Preparation Manual* |
| Department | *Construction Site Best Management Practices (BMPs) Manual* |
| Department | *Construction Manual* |
| Department | *Design Information Bulletin 83* |
| Los Angeles County Department of Public Works (LACDPW) | *Hydrology Manual* |
| FHWA | Hydraulic Engineering Circular Number 21 (HEC-21)<br>Design of Bridge Deck Drainage Systems |
| AASHTO | *Roadside Design Guide* |
| AASHTO | *Model Drainage Manual* |
| Department | *Fish Passage Design for Road Crossings* |
| 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 Software*

The Design-Builder shall 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 at its own discretion use any software when submitting plans for approval but shall prepare final drawings in MicroStation V8 or the latest version available upon agreement from the engineer.

### *12.2.4 Data Collection*

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

The Design-Builder shall identify all water resource 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 resource 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 drain 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.

### *12.2.5 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

### *12.3.1 Overview*

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

The Design-Builder shall develop a Project Drainage Concept Plan which shall serve as the base plan for final drainage design. The Project Drainage Concept Plan shall show the existing drainage features and proposed Project drainage master plan, including the following, at a minimum:

- Drainage areas and contributing flows of existing and proposed drainage
- Summary table with time of concentration (Tc) and curve numbers and/or runoff coefficients
- Impacts from the Project and proposed mitigation within the Map extents
- Waters of the State, outstanding resource value waters and impaired waters within 2,000 feet of the Project
- Ultimate discharge locations and waters receiving Project runoff

### *12.3.2 Project-Specific Requirements*

The Design-Builder shall design and construct the drainage systems to meet the following requirements:

- Maintain the post-construction discharge rates at the existing rates and discharge points
- Collect, control, and discharge stormwater from within the R/W limits. Do not allow drainage from the R/W to run onto private property.
- Provide a 50-year service life on all proposed drainage facilities within the Project limits.
- Provide a safe environment for those who use and maintain the Project.
- Locate existing drainage facilities and identify ownership, size, material, and condition.
- Design and construct new drainage facilities to minimize impacts on existing facilities.
- Meet all permit requirements.

### *12.3.3 Surface Hydrology*

#### 12.3.3.1 Design Frequencies

The drainage design frequencies within the R/W shall be as indicated by the *Caltrans Highway Design Manual*, but in no instance shall the storm drain system be designed for a frequency less than the 25-year rainfall event. Drainage systems outside the R/W shall be designed for no less than a 25-year rainfall event. If the proposed drainage system design includes a pump station or sump, a 50-year rainfall event shall be used as the design frequency.

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

#### 12.3.3.2 Hydrologic Methods

The Design-Builder shall perform hydrologic analyses as prescribed by the *Los Angeles County Hydrology Manual* and follow design methodology as prescribed by the *Caltrans Highway Design Manual*. The drainage areas shall be modeled to include future development and increased runoff associated with development. Flood damage potential for the completed Project shall not exceed pre-Project conditions.

### *12.3.4 Hydraulic Structures*

#### 12.3.4.1 Culverts

A culvert is a hydraulic structure sized to convey water runoff under a highway, railroad, or other embankment, as defined in the HDM. Minor culverts are 48 inches or less in diameter; major culverts are 54 inches or larger.

The Design-Builder shall 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 affected cities' storm water management and quality criteria and/or master drainage plans.

#### 12.3.4.2 Bridges

Runoff from bridge decks shall be carried off the bridge and into the adjacent proposed or existing roadway drainage system. The roadway drainage design shall include bridge approach drains to intercept gutter flow. These drains, and any temporary drains, are to be constructed at time of bridge deck placement. Stormwater flowing toward the bridge shall be intercepted prior to the approach slab. The Design-Builder shall comply with bridge deck drainage design as outlined in HEC-21, Design of Bridge Deck Drainage.

Stormwater spread shall not encroach upon proposed or existing travel lanes during the design storm. Bridge deck drainage systems shall be compatible with the structural reinforcement, components, and aesthetics of the bridge. Deck drainage outfalls shall be positioned to avoid corrosion of bridge structural members, erosion of embankments, and splashing of moving traffic and sidewalk areas below the bridge.

Runoff from bridge deck drains shall be routed into the temporary or permanent BMP system. The BMP systems shall be sized to include this runoff as well as any other runoff from the Project and comply with the requirements of Section 22 (Stormwater).

#### 12.3.4.3 Storm Drains

The storm drain system design shall include these items:

- Final 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. These shall 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 centerline of roadway; gutter spread calculations; length of pipe; class/gauge of pipe; and numbered drainage structures with coordinate locations and elevations.

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

#### 12.3.4.4 Roadside Open Channels

If roadside open channels are 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.

### *12.3.5 Released for Construction Documents (RFC)*

The Released for Construction Documents shall include the following items:

- Drainage plans
- Drainage profiles
- Drainage quantities

#### 12.3.5.1 Drainage Plan Sheets

- Provide drainage structure data (type, location, diameter, length, class tabulations) and details, roadway cross slope and superelevation, and a complete set of roadway cross-sections to show the construction staging and associated temporary drainage.
- Walls, bridges, paths/walks, lakes, rivers, environmentally sensitive areas, existing drainage structures, proposed drainage structures, surface flow arrows.
- Show existing and proposed contours, high and low point station and elevation, roadway cross slope and superelevation.

#### 12.3.5.2 Drainage Profile Sheets

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

#### 12.3.5.3 Drainage Quantity Sheets

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

#### 12.3.5.4 Project-Specific Specifications and Special Provisions

If the Design-Builder proposes to use methods or materials that are not in standards, the Design-Builder shall submit request include the method and materials in the design. The submittal shall include comprehensive specifications and provisions associated with the proposed non-standard methods or materials. 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* or when proposing the use of a nonstandard special provision no already listed in the Contract Documents.
- 120 Days for use of experimental or nonstandard design procedures that are not supported by the Department Standards.

### *12.3.6 Reports/Project Documentation*

The Design-Builder shall provide reports and documentation to the Department, City of Baldwin Park, County of Los Angeles, and/or other Local Agencies whose facilities will be affected by the Project. Prior to providing final documents to any agency, the Design-Builder shall submit Drainage Design Report to the Department for review. Construction of drainage systems connecting to City of Baldwin Park, County of Los Angeles or other Local Agency drainage facilities shall not commence until issuance of a permit, obtained by the Design-Builder, from the applicable Local Agency for the improvements.

#### 12.3.6.1 Drainage Design Report

The Design-Builder shall prepare a Drainage Design Report signed by a California-licensed Professional Engineer that 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
- Complete set of calculations and detailed drainage area maps

- Correspondence file

The Design-Builder shall prepare bound reports and Project documentation organized by design topic.

#### 12.3.6.2 Hydraulic Infrastructure Inventory

The Design-Builder shall deliver an inventory of the hydraulic infrastructure of the completed Project by providing an InRoads Storm and Sanitary SWF file of all installed pipes and structures.

## 12.4 Construction Requirements

Drainage facilities shall be designed to accommodate construction staging and shall be provided during all stages of construction. This drainage can be permanent, temporary, or a combination of the two. The Design-Builder shall provide drainage design details for each stage of construction. At a minimum, temporary drainage systems shall be designed for a 2-year event. The design shall include temporary water pollution control and other Best Management Practices needed to satisfy the NPDES and other regulatory requirements. The notes in the RFC Documents shall include a description of the drainage design for each stage of construction.

Storm drain construction can occur by either open cut or trenchless methods as detailed in the HDM.

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

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

All surfaces impacted by construction shall be restored.

Storm drain within roadway areas being milled and overlaid shall remain in place. Castings shall be adjusted if needed on a case-by-case basis to meet the required casting depth below pavement. If castings need adjusting, they shall be raised as a whole.

The following pipe joints shall be tied and made watertight:

- All joints either within 100 feet of an outlet or from the last manhole prior to the outlet, whichever is less
- All bend sections and three joints on each side of bend
- All drainage pipes passing through former or current oil operation areas or in areas identified as being impacted by the presence of underground oil contamination.

## 12.5 Deliverables

### 12.5.1 Released for Construction Documents (RFC)

The Design-Builder shall produce plans and specifications in a format that facilitates design review by the Department. Refer to the Caltrans CADD Manual, Plans Preparation Manual, and the Design Quality Management Plan, for required information on Released for Construction documents. All RFC documents shall be approved by the Department prior to any construction activities. The RFC documents shall include the following items:

Drainage Plans

- Drainage Profiles
- Drainage Details
- Drainage Quantities
- Specifications and Special Provisions

These RFC documents, and any subsequent revisions, shall be signed and sealed by the Traffic Engineering Manager 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 5 working days prior to implementation.

Unless otherwise indicated, all deliverables shall be submitted in both electronic format and hardcopy format. Acceptable electronic formats include Bentley Microstation/Inroads, Microsoft Word, Microsoft Excel, or Adobe Acrobat (.PDF) files, unless otherwise indicated. At a minimum, the Design-Builder shall submit the following to the Department:

| Deliverable | For Acceptance or Approval | Number of Copies | | Submittal Schedule | Reference Section |
|---|---|---|---|---|---|
| | | Hardcopy | Electronic | | |
| Project Drainage Concept Plan | Approval | 5 | 1 | Prior to NTP2 | 12.3.1 |
| Drainage Design Report | Approval | 5 | 1 | Prior to Final Acceptance | 12.3.6.1 |
| Hydraulic Infrastructure Inventory | Acceptance | 5 | 1 | Prior to Final Acceptance | 12.3.6.2 |
| Project-Specific Special Provisions(1) | Acceptance | 5 | 1 | At least 10 Days prior to use in construction | 12.3.5.4 |

Notes:

(1) Required only if Design-Builder is proposing non-standard methods or materials

### 12.5.2 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.

# 13 STRUCTURES DESIGN

## 13.1 General

All structures and modifications 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.

Design-Builder shall furnish structure and project quantities summarized in the appropriate Department Quantity Summary and Estimate Forms.

Bridge Specific Technical Provisions 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 Walls

**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 | AASHTO | LRFD Bridge Design Specifications – 5th Edition, only for Section 10.5.4 |
| 4 | Department | Bridge Design Specifications (LFD Version, April 2000) |
| 5 | Department | Bridge Memo to Designers |
| 6 | Department | Bridge Design Aids |
| 7 | Department | Bridge Design Details |
| 8 | Department | Bridge Design Practice, as appropriate |
| 9 | Department | Bridge Standard Detail Sheets (XS Sheets) |
| 10 | Department | Structural Detailing Standards |
| 11 | AASHTO | Guide Specifications for Seismic Isolation Design, 2nd Edition with 2000 Interim Revisions. |
| 12 | AASHTO | Guide Specifications for Design and Construction of Segmental Concrete Bridges |
| 13 | CEB-FIB | Model Code for Concrete Structures, Appendix E: Time Dependent Behavior of Concrete, Creep and Shrinkage |

| | | |
|---|---|---|
| 14 | Department | Standard Special Provisions |
| 15 | Department | Standard Plans |
| 16 | Department | Design-Build Modifications to the Standard Specifications for Construction |
| 17 | Department | Standard Specifications |
| 18 | Department | Bridge Deck Construction Manual |
| 19 | Department | Falsework Manual |
| 20 | Department | Foundation Manual |
| | Department | Office of Special Funded Projects (OSFP) Information and Procedures Guide |
| | Department | Prestress Manual |
| | Department | Construction Manual |
| | Department | Bridge Construction Record and Procedures Manual |
| | Department | Trenching and Shoring Manual |
| | Department | Outline of Field Construction Practices |
| | Department | Plans Preparation Manual |
| | USA | Surface Mining and Reclamation Act of 1975 |
| | California | Public Contract Code |
| | Department | Bridge Inspection Report Information System (BIRIS) |
| | AASHTO | Manual for Bridge Evaluation, 2nd Edition |
| | Department | Highway Design Manual (HDM) |
| | Department | Plans Preparation Manual |
| | DTSC | ADL Variances |
| | Department | Landscape and Structures Aesthetics Handbook |
| | Various | Technical Memoranda |
| | USDOT | Record of Decision (ROD) |
| | Department | Final EIR/EIS for Project |
| | | **Sign and Lighting Structures** |
| | AASHTO | Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals, 5th Edition with Interm Revisions |

Any non-standard structures designs, specifications, 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 current 2006 Standard Plans including Revisions to Standard Plans (RSPs) shall be incorporated into the structure plans as applicable.

### *13.2.2 Structure Design Submittals*

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

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

*Concept Design- Structure Type Selection (30 %) Submittal*

The Design-Builder shall submit a Preliminary (30%) General Plan and Type Selection report for each structure requiring a type selection process to the Department for review and approval. Preliminary (30%) General Plan and Type Selection Report shall be prepared in accordance with preliminary data checklist provided in Caltrans *Bridge Design Aids and MTD 1-29*. The Type Selection Report shall include but is not limited to the following:

- Evaluation and location of deck drains for widened structures.
- Recommended maintenance work reflected in structure maintenance records.
- A quantitative seismic retrofit evaluation of all existing structures to be widened, modified, or replaced. For existing structures to be widened, the Type Selection report shall include a summary of the seismic evaluation of the existing bridge, the potential retrofit strategies with supporting documentation, and other pertinent details.

Preliminary Foundation and Geotechnical Report and other applicable documents

- Location of Hinges, Hinge access and Type of Joint Seal assemblies.

Type Selection reports shall clearly delineate aesthetic features the Design-Builder has incorporated into the structure type. The bridge aesthetic treatment shall be reviewed and approved prior to submitting the Type Selection Report.

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 will be held at project specified co-located 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 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 two (2) weeks 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.

*Intermediate Design- Unchecked (60%) Structure Plans Submittal*

The Design-Builder shall submit the Intermediate (60%) Unchecked Structure Plans to the Department for review and constructive feedback for use in preparing subsequent submittals. The bridge 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 (60%) Structure 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; foundation layouts; foundation details and design tables; boring logs; abutment details; bent details; framing plans and elevations; hinge details, slab plans, typical sections and details; beam details and data sheets; joint seal details, deflection and camber diagrams; Draft Final Foundation and Geotechnical Reports, and other details as applicable. Packages shall list the Department bridge standards to be used. Proposed modification to the Department standards and draft structures special provisions to standard specifications shall also be provided.

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

### *Final Design- Checked (100 %) Structure Plans Submittal*

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

The Final checked (100%) submittals will not be considered complete unless all the design and independent check calculations are available and completed. The completed design and independent check calculations shall be available for review.

### *Released-for-Construction (RFC) Submittal*

The Design-Builder shall include all bridge and structural details in the Final RFC submittal. For RFC submittal procedure refer to Section 2.4.2.3.5 "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.

### *Final As-Built Structure Plans Submittal*

The Design-Builder shall submit structure As-Built plans and documents per Section 2.4.3.4 "As-Built Documents" and Section 13.5.

### *Additional Submittals for Retaining Walls*

The Design-Builder shall provide a Preliminary Geotechnical Report and a Geotechnical Design Report for standard retaining walls. For nonstandard walls, the Design-Builder will provide a Preliminary Foundation Report along with the Type Selection Report and a Foundation Report at the 65% Unchecked Submittal stage. The Preliminary Geotechnical Reports, Geotechnical Design Reports, Preliminary Foundation Reports, and Foundation Reports shall conform to Technical Provisions Section 8, "Geotechnical".

# 13.3 Design Requirements

## *13.3.1 Bridge Design*

A Project Specific Bridge Design Criteria is required for segmental bridge structure types, should segmental bridge is selected by the Design-Builder and approved by the Department. The Department has developed a Project Specific Bridge Design Criteria-Segmental Structures (Exhibit 13-A) and the template contains minimum design requirements for segmental bridge structures. The Design-Builder shall enhance the criteria as necessary to provide an overall comprehensive bridge design criteria for the Project. The Design-Builder shall cover all the topics contained in the Department's Template and meet all requirements of the Contract. This Bridge Design Criteria supersedes the standards listed in Section 13.2 and will be subject to the Approval of the Department unless Cast-In-Steel-Shell is used with shear connectors and designed for.

The interchange connector bridge structure shall accommodate a 12 foot lane with a 5-feet left shoulder and a 10-feet right shoulder. The bridge branches off southbound I-605 to westbound over the existing directional connector, crossing over I-605 and I-10 freeways, and joining back into eastbound I-10 after crossing over the Athol St Overcrossing. The horizontal and vertical alignment and the bridge width shall conform to the final approved geometric layout.

### *13.3.1.1 Proposed bridge scope and work*

The proposed bridge structure has an estimated total length of 4,145 feet and the propose bridge description and work include the following:

a) Design and construct abutments and column pier/bent substructures; the superstructure is supported on single-column bents and seat-type abutments.

b) Design and construct a 15-span bridge superstructure with a length of 3,280 feet; the proposed superstructure is a CIP/PS progressive segmental box girder frame spanning over I-605 mainline and a balanced segmental CIP/PS box girder frame spanning over I-10 mainline. The remaining spans are constructed of CIP/PS box girder superstructure. The proposed structural depth is 10'-0" crossing over I-605 and varies from 10'-0" to 18'-0" when crossing I-10. Construct Type 736 barrier rail on the left edge of deck and Type 742 barrier rail on the right edge of deck.

c) Design and construct earth-retaining approaches to the bridge with estimated length of: a 510 feet and a 360 feet MSE wall at the beginning and the end of the bridge, respectively.

d) Design and construct Approach Slab Type N(30S) at both ends of the bridge.

e) Remove existing soundwalls barrier rail and associated pile foundations that are in conflict with the proposed bridge substructures and foundations, and construct new soundwalls and foundations along Dalewood Street.

f) The bridge deck shall be subject to "grinding and longitudinal grooving" in accordance with the Department Specifications for reduce noise on decks. This will require the placement of an additional ¼" thickness of sacrificial concrete cover to the top mat prior to grinding and grooving.

g) Construct joint seal assemblies across all joints.

Additional design requirements include the following:

a) The bridge shall be designed and constructed to accommodate future overlay loads (35psf)

b) The bridge superstructure exterior girder face shall have consistent geometry throughout the bridge lengths

c) If the bridge superstructure exterior girder face is vertical, then the exterior soffit corner shall be rounded and the exterior girder face shall have a two-inch aesthetic treatment similar to that on the NB605/Rte10 Separation (53-3027H)

d) For segmental bridges, the bridge decks shall be prestressed in the transverse direction

e) If precast segmental box girders are used on any span, then an 1-inch polyester concrete wearing surface shall overlay the concrete deck of the entire bridge

f) If box-shaped column sections are used, then a minimum 1-ft by 1-ft chamfer shall be provided at all exterior corners

g) The barrier rails shall provide two 2-inch electrical conduits and one 3-inch conduit.

h) Aesthetics of the structures shall meet the requirements in Book 2 Section 15- Visual Quality Management.

i) The long term creep and shrinkage should be considered for the final profile of the Bridge structure.

### *13.3.1.2 Vertical Clearances*

The proposed bridge structure shall meet the following vertical clearances:

a) Final Minimum Vertical Clearances are: 21'-6" over I-605 southbound, 27'-2" over I-605 northbound, and 16'-9" over Athol St Overcrossing, respectively.

b) Temporary Minimum Vertical Clearances for falsework opening are 17'-11" overI-605 southbound, and 15'-6" over Athol Street.

c) Further study and field survey are recommended to confirm the actual vertical clearance.

The minimum vertical clearances for the Project shall meet the following:

a) Permanent Minimum Vertical Clearances: 16'-6" over freeway mainlines, connectors, ramps, and Athol Street.

b) Temporary Minimum Vertical Clearances for falsework openings: 16'-0" over freeway mainlines, connectors, and ramps; 15'-6" over Athol St.

c) Vertical clearance over other local streets shall be 15'-0".

### *13.3.1.3 Foundations*

The proposed foundation type is Cast-In-Drilled-Holes (CIDH) Piles.

Settlement- Bridge substructure foundations shall be designed to allow a maximum of one (1) inch total settlement. One-inch differential settlement may be allowed if a structure analysis verifies the design and the required level of serviceability.

The Design-Builder shall perform geotechnical investigations at the bridge site and produce a Geotechnical and Foundation Recommendation Report. Foundation type, capacity, estimated lengths, and bottom elevations shall be determined by the Design-Builder in accordance with the Geotechnical Report for the structure. Abutments and bents foundations types may be selected in accordance to the Geotechnical Report. Analysis shall include bearing capacities, factors of safety and an estimate of total and anticipated differential settlement for each structure.

***For preliminary geotechnical and seismicity information, see the Revised District Preliminary Geotechnical Report (DPGR) and the Log of Test Borings (LOTBS). Differential settlement between individual piles within a pier shall be limited to 0.25 inches.***

### *13.3.1.4 Seismic Design*

Several hinges are needed to separate the bridge into multiple frames.

In addition to the requirements of the Seismic Design Criteria and other Department standards, the following design and analysis procedures are required:

#### *Performance Assessment*

The seismic performance of all structures shall be assessed by verifying estimated structural demands on components are less than or equal to estimated structural capacities of those components.

All capacity-protected components, as defined by Caltrans *Seismic Design Criteria* or these criteria, shall have a force D/C ratio of 1.0 or less when subjected to over-strength forces.

Demands on structural components of the bridge shall be determined by analysis of global three dimensional computer models of the bridge that represent its dominant linear and nonlinear behavior and the effects of soil-foundation-structure interaction. Demands will be evaluated as load-type quantities (forces and moments) or as displacement-type quantities (displacements, relative displacements, and rotations) as required by the evaluation rules for various components.

Seismic demands for the bridge structures shall be determined by the appropriate methods specified in the Seismic Design Criteria and the following:

- Nonlinear multi-support dynamic time-history analysis.
- Site-specific response spectrum analyses.

The nonlinear time-history analysis will be for multiple-support excitations developed considering the propagation of the seismic waves from the fault to the bridge site and the passage of seismic waves through the site to account for incoherence of the seismic motions. Three sets of ground motions shall be used and the final design shall be based on the maximum response obtained from using the Seismic Design Criteria, site-specific response spectrum analyses, and the nonlinear time-history analyses.

Response spectrum analysis shall use the Complete Quadratic Combination (CQC) rule for the modal combination methods and the Complete Quadratic Combination- 3 (CQC3) rule for the ground motion directional combination methods

Non-linear dynamic time-history analysis shall incorporate the following:

- Boundary condition non-linearities will be accounted for in the form of gap elements at expansion joints and foundation impedances.
- The structural model shall explicitly consider the geometric nonlinearity, inelastic structural components and other inelastic elements (e.g. dampers).
- Any reinforced concrete members with a force Demand/Capacity (D/C) ratio larger than 0.5 will be modeled with adjusted material and section properties to represent the cracked section. Structural steel members with a force D/C ratio less than 1.5 will be modeled with elastic elements. Any members with a force D/C ratio larger than 1.5 will be modeled with nonlinear elements.

Foundation substructure models may be used to capture significant soil-pile interaction effects. The

foundation substructure should consist of a linear stiffness and mass matrices representing the entire soil-pile system and a set of equivalent ground motion representing the kinematic effect of the depth-varying motions.

Rayleigh damping is to be used for non-linear dynamic time-history analysis. Modal damping may be used for other analytical tools. The range of Rayleigh damping values represents the target maximum and minimum damping values that apply over the dominant periods of the various element groups. Rayleigh damping ranges for non-linear dynamic time-history analysis shall be within the following ranges:

Reinforced Concrete Substructure/Columns: 4% - 6%
Steel Superstructure: 2% - 5%
Concrete Superstructure: 3% - 5%

Rayleigh damping will be incorporated into the model with values for each element group representing the expected extent of inelastic energy dissipation in that group. Judgment shall be used in defining the range of dominant periods for the various components and the variation of Rayleigh damping with structure period.

Modal Damping for Other Analytical Tools:

Reinforced Concrete Columns: 5%
Reinforced Concrete Towers: 5%
Steel Superstructure: 3%
Concrete Superstructure: 5%

No damping for foundation elements shall be permitted.

### *Seismic Loading during Construction*

During all phases of construction, the main span bridge shall be designed to resist an equivalent static force of 0.1g for all configurations occurring during a construction sequence.

### *Definition of Ground Motions*

Ground motions for use in dynamic seismic analysis of the bridge structure shall be taken from the project geotechnical report(s). The ground motions shall consist of three, 2-component time histories. Each time history shall consist of 2-horizontal orthogonal components. The three sets of ground motion time histories shall be spectrum compatible for their respective firm ground acceleration spectra.

The acceleration response spectra shall be based on the outcrop of the firm ground. Development of the ARS (Acceleration Response Spectrum) curves for bridge design using a response spectrum approach shall consider wave propagation in local soil conditions and a soil-structure interaction (SSI) mechanism. The equivalent linear one-dimensional site response analysis using site-specific soil properties is conducted to evaluate the free-field motions. The SSI analysis shall take into account the depth-varying free-field ground motions and the kinematic interaction between soil and pile within the significant soil-pile interaction zone.

The potential effects of local soil conditions and soil-foundation-structure-interactions (SFSI) shall be considered in the development of the design ground motion for the bridge structures. In addition, due to the length of the main bridge structure, the potential effects of spatial variation of ground motions such as due to wave passage and loss of coherence shall be considered when developing design ground motions for multiple support time histories analysis.

The ground motions and the the ARS curves shall be reviewed and approved by the Department before application to analysis and design.

The bridge shall be instrumented to record accelerations from strong ground motions. The bridge shall be designed and constructed to accommodate motion sensors and accessories.

#### *13.3.1.5 Hydraulics*

Bridge deck drains shall be provided when drainage design requires drain inlets located on the bridge superstructure. Bridge deck drains shall be part of a closed drainage system and drain into a water quality system or a storm drainage system as required in Section 12, Book 2. Closed drainage systems shall include piping cast into the bridge columns; exposed piping on the outside of columns and on the outside of the superstructure girders shall not be permitted. The Design-Builder shall not use an open rail system.

#### *13.3.1.6 Construction issues*

a) Foundation

The proposed bent foundation at the median of I-605 has a potential conflict with the abutment foundations of the existing bridge structure. Construction of foundations and bents at the medians of I-605 and I-10 may induce shifting of the existing interior lanes and the newly constructed I-10 HOV lanes. The proposed bent columns and foundations will have conflict with the existing soundwall barrier and pile foundations along the Dalewood Street. The conflict will require the Desing-builder to remove existing soundwalls and associated pile foundations that are in conflict with the proposed bridge substructures and foundations, and construct new soundwalls.

b) Superstructure

The bridge has several long spans that measure between 350ft to 425ft. Segmental box girder superstructure is recommended to bridge the spans since segmental structures are the most feasible alternative for long-span construction. The segmental box girder superstructure may require special equipment for construction.

c) Stage Construction

Different bridge frames may be constructed in multiple stages. The proposal in the Advance Planning Study assumes a two-stage construction.

#### *13.3.1.7 Maintenance Issues*

Joints- Several superstructure hinge joints are required along the structure. The design and location of the hinge joints shall provide for maintenance accessibility and future replacement. Soffit access openings shall be provided in every frame.

### *13.3.2 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*.

### *13.3.4 Other Structure Design*

#### *13.3.4.1 Approach Slabs*

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

#### *13.3.4.2 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 Department's standards, including visual impacts and community input.

#### *13.3.4.3 Utilities and Existing Facilities*

The Design-Builder will be required to locate all existing underground and overhead utilities on or adjacent to the proposed structures and existing structures to be modified. Design-Builder's attention is directed to the existence of overhead power lines on or adjacent to the proposed structures.

#### *13.3.4.4 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
- Pumping plants
- Reinforced concrete boxes

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*, I-10 Corridor Aesthetics Details or Visual Quality Manual, and other applicable requirements included in these Technical Provisions and Department's 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.

### *13.3.4.5 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 ROW, 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 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.

Wall type selection and design by the Design-Builder shall meet applicable requirements of the Standards. The Design-Builder shall design earth retaining walls and underground structures by the Load and Resistance Factor Design (LRFD) methods and not rely on design related information in the Standard Plans2006 as they have not been updated for LRFD design methodology. The Design-Builder shall, however, follow requirements of the Standard Plans as they relate to non-design related items such as drainage materials and sizes or earthwork criteria.

The Design-Builder shall not use any non pre-approved Proprietary wall system. 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 steel sheet pile, timber, or recycled material for permanent retaining walls or the retaining wall foundations.

The Design-Builder may use timber lagging for soldier pile walls when a concrete facing is used.

Soil Nail wall 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.

For design conditions outside of the design parameters in Caltrans *Standard Plans* retaining walls can be designed by the Design-Builder in accordance with the Department requirements.

The Design-Builder shall not change or inter-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.

The Design-Builder shall notify the Department of any potential right of way conflicts at the preliminary design stage.

For all retaining walls, total settlement and overall tolerances shall be based on site-specific requirements determined by the geotechnical engineer.

### *13.3.5 Reference Materials*

Structure reference materials included in the Reference Information Documents are for Design-Builder‘s information only. The structure reference materials include As-Built plans of adjacent existing bridges,

Advanced Planning Study (APS) reports, retaining wall/drainage structure sections, survey information, existing bridge photographs, etc.

#### *13.3.5.1 Advance Planning Studies*

Advance Planning Study (APS) reports are included in the Reference Information Documents. The APS 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 submitted and approved as Alternative Technical Concept.
- 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 I-10 Corridor Aesthetics Details or Visual Quality Manual.
- A quantitative seismic retrofit evaluation of all existing structures to be widened, modified, or replaced is required to ensure conformance with current standards and to determine the extent of required retrofit. Evaluation results and seismic retrofit recommendations, if any, shall be included in the Type Selection reports.

### *13.3.6 Structure Types Restricted from Use*

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

- C-bents; outrigger bents spanning over I-605 mainline; outrigger bents spanning over I-10 mainline
- Structural steel bridge superstructures (e.g. girders and ben caps).
- Open-girder superstructure systems (i.e. any girder system without bottom slab soffits)
- Integral-type abutments
- Soil-nail wall and mechanically-stabilized earth (MSE) systems serving as bridge abutments
- 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 by the Department.
- Asphalt concrete overlay on bridge decks

### *13.3.7 Bridge Structure Element Products*

All manufactured bridge structure element products (bearings, joint seal assemblies, dampers, seismic isolations devices, and etc) shall adhere to the Standards and any products that are not on the Department Pre-qualified List shall be required to go through the Department New Product Evaluation process, unless specifically exempt by the Department.

All seismic modification devices (isolation bearings, dampers, and etc) shall be pre-qualified in accordance to the requirements and the test results shall be submitted in accordance to the test plans as posted on the following website:

http://www.dot.ca.gov/hq/esc/earthquake_engineering/seismic_response_modification_devices_site/

The design of seismic isolation devices shall follow the AASHTO Guide Specifications for Seismic Isolation Design, 2nd Edition with 2000 Interim Revisions. The design and testing of all bridge element products shall reflect all the actual loading conditions and load combinations in accordance to the AASHTO LRFD Bridge Design Specifications 4th Edition and California Amendments.

### *13.3.8 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 (2nd Edition) and AASHTO LRFD Bridge Design Specifications with California Amendments. The ratings shall be based on the final As-Built configuration of the bridges and complete and detailed Aas-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.

## 13.4 Construction Requirements

### *13.4.1 Bracing*

Temporary wind bracing shall be required during placement and construction of structural steel in the field.

### *13.4.2 Surface Finishes of Structural Steel*

All concrete surfaces shall receive a surface finish in accordance with the Standard Specifications. All steel surfaces shall be finished following Department's standard painting specifications found in the Department *Standard Specifications for Construction*, and the special provisions for particular bridge elements. Finish colors shall be selected during the Visual Quality Management Process outlined in Section 15.

### *13.4.3 Bridge Decks*

Deck construction of bridges shall comply with the *Standard Specifications*. A permanent point shall be marked on the concrete barrier on the exterior edges of bridges 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. The bridge deck shall be subject to "grinding and longitudinal grooving" in accordance with the Department Specifications.

### *13.4.4 Falsework*

Falsework supports shall not be placed on or supported by existing bridge structures adjacent to or nearby the proposed bridge structure.

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

No adjustment of falsework grade or changes to any vertical or lateral component of falsework is allowed without the presence of Design-Builder's Registered 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 five (5) feet and extending ten (10) feet beyond the edges of deck.

Three (3) weeks shall be allowed by the Design-Builder for review of falsework drawings at all locations.

Falsework openings over highways and local streets shall provide a minimum width to allow for the number of traffic lanes that exist prior to construction at each location, as specified in the Book 2 Section 18, Maintenance of Traffic.

Falsework adjacent to traffic shall be protected by barriers approved by the Department.

### *13.4.5 Construction Impacts and Order of Work*

Construction impacts to the existing traffic shall meet the lane requirements and closures restrictions specified in Section 18.3, Book 2. The construction work that impacts the existing traffic includes, but not limited to, the following:

a) I-605 mainline and ramps: bridge foundation, bent, and superstructure construction work.

b) I-10 mainline and ramps: bridge foundation, bent, and superstructure construction work.

c) NB605/EB10 Connector: Foundation, bent, and superstructure construction work.

d) Dalewood and Athol Streets: Foundation, bent, and superstructure construction work.

Construction of the bent foundation and pier in the I-10 median and along the I-10 freeway corridor shall be the first order of bridge work in the contract.

### *13.4.6 Demolition of Structures*

Demolition plans and calculations, and temporary bridge support plans, if necessary, are required to be approved by a Civil or Structural Engineer registered in the State of 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 registered 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.

Bridge removal work that requires the Contractor's registered engineer to prepare and sign the bridge removal plan shall have the contractor's registered engineer present at all times while the bridge removal operations are in progress.

### *13.4.7 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"**.**

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. The requirements of this section shall apply to materials furnished for the project, except for acquisition of materials in conformance with the provisions in Section 4-1.05, "Use of Materials found on the work," of the Standard Specifications.

## 13.5 Deliverables

### *13.5.1 Structure Construction Forms and Documents Required*

The Design Builder shall submit following completed forms and documents to the Department;

- Report of Completion
- Pile driving logs and pile layout at the completion of the operation for each location of bridges, retaining walls and sound walls.
- Report of falsework clearance, (Form SC 12.6.1, formerly Form DS-OSC 108).
- Cast In Drilled Holes (CIDH) Pile Quantity and Drilling Record.
- Test Result Summary sheet for couplers and location of couplers.
- Pre-Stressing Monitoring for concrete structures.
- Pre-Stressing Calibration Monitoring Sheet for concrete structures.
- Notice of Change in Clearance or Bridge Weight Rating, (Form TR-0019 or TR-0029).
- Notice of Change in Vertical or Horizontal Clearance.
- Joint Movement calculations for type "B" seals and Joint Seal Assemblies.
- Column Guying plans.
- Falsework plans.
- Structures As-Built plans including the complete bridge load-rating report.
- Bridge demolition plans.

- Profilegraph test results (CA Test 547)
- Skid test results (CA test 342)
- Test results of concrete samples

The Design Builder shall provide the Department with completed project files at the end of the project.

### *13.5.2 Mock-ups and Samples*

Mock-ups and samples will be required for all structure products (e.g. joint seal assembly, soundwall block, MSE concrete panel, and etc.) for approval by the Department of textures, colors and construction methods a minimum of 14 days prior to construction. Approved mock-ups and samples will be used as a standard throughout construction.

# EXHIBIT 13-A

Project Specific Bridge Design Criteria-Segmental Structures

This exhibit is provided as an electronic file.

# 14 LANDSCAPE

## 14.1 General

The Design-Builder shall perform all Work necessary to meet the requirements for vegetation, including the creation of highway planting and irrigation plans demonstrating preservation and protection of existing vegetative assets, erosion control, plant establishment and worker safety.

The Design-Builder shall design and construct the highway planting and irrigation 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.

The Design-Builder shall coordinate with all 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.

## 14.2 Administrative Requirements

### *14.2.1 Standards*

The Design-Builder shall design and construct the highway planting and irrigation elements in accordance with the relevant requirements of the standards listed by priority below

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

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

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

**Highway Planting and Irrigation Standards**

| Priority | Agency | Title |
|---|---|---|
| 1 | Department | Highway Design Manual (HDM) |
| 2 | Department | Standard Specifications |
| 3 | Department | Standard Special Provisions |
| 4 | Department | Standard Plans |
| 5 | Department | Construction Site Best Management Practices (BMPs) Manual |
| 6 | Department | Storm Water Pollution Prevention Plan (SWPPP) and Water Pollution Control Program (WPCP) Preparation Manual |
| 7 | Department | Project Planning and Design Guide |
| 8 | Department | The Plant Setback and Spacing Guide |
| 9 | Department | Final Environmental Document |
| 10 | Department | Technical Memoranda |
| 11 | Department | Landscape Architecture Program P.S.&E. Guide |
| 12 | Department | Route 10 Widening Aesthetics Concepts |

### *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.

**Highway Planting and Irrigation References**

| *Agency* | *Title* |
|---|---|
| Department | The California Native Wildflower Checklist and Native Plant Database |
| Department | The Water Conservation Deputy Directive (DD-13) |
| 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 |

### *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 Highway Planting and Irrigation section.

### *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 at its own discretion use any software when designing plans for approval but shall prepare final drawings in MicroStation V8 or the latest version available upon agreement from the engineer.

### *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 highway planting and irrigation 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.

## a. Design Requirements

### *14.3.1 Highway Planting and Irrigation Concept Meeting*

The Design-Builder shall take an inventory of all the existing highway planting and irrigation elements in the Project. The Design-Builder shall schedule and participate in a highway planting and irrigation concept

meeting to present a layout of the in-place and proposed highway planting and irrigation elements on the Project to Department.

### *14.3.2 Requirements*

The Design-Builder shall follow Exhibit14- A to determine the permanent highway planting and irrigation needs of the Project.

Design and construct all highway planting and irrigation 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;

The Design-Builder shall select a project-wide aesthetic and landscaping theme. 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 or the proposed project theme. Select the best plants to meet the needs and requirements within each of the various planting areas. Consider the functionality 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 to be considered. Plant material shall be drought tolerant and conform to the requirements of the *Highway Design Manual*.

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

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

### *14.3.3 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 Department 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 with temporary impacts occurring within temporary construction easements. Provide grading; strip, stockpile and reapply all topsoil; and provide plant material as needed. Obtain property owner approval on the final condition of the site. The contractor shall treat all disturbed slopes immediately after construction to reduce erosion.

### *14.3.4 Planting*

Planted areas shown on the preliminary engineering plans to be protected and maintained shall be replaced if damaged during construction.

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.

***14.3.5 Irrigation***–The Design-Builder shall replace all major existing irrigation facilities impacted by construction activities. Major irrigation facilities include, but are not limited to, main water supply line, control valves and irrigation controllers.

Existing irrigation water line crossovers and conduits shall be located and checked for proper operation prior to performing any design work on the irrigation system. Work performed in connection with the various existing highway irrigation system facilities shall conform to the standards listed under Landscape and Irrigation Standards and Requirements. Existing irrigation facilities that are to remain or to be relocated shall be checked for proper operation in conformance with the standards listed under Landscape and Irrigation Standards and Requirements prior to clearing and grubbing activities.

## 14.4 Construction Requirements

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

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

### *14.4.3 Plant Establishment*

The Plant Establishment shall commence upon receipt of a written "Notice of Substantial Landscape Completion". The Design-Builder shall follow Plant Establishment (Type 2) as defined in Caltrans Standards Specifications and Standard Special Provisions. The Plant Establishment period shall last for 365 calendar days. All landscape installations shall be completely maintained by the Design-Builder during the Plant Establishment. Landscape installations will be audited on at least a monthly basis to determine the acceptability of the maintenance Work. Nonconforming maintenance will be brought up to acceptable levels within five (5) Days of receipt of notice of maintenance deficiencies. Weeds shall be controlled within the entire project limits as described the Caltrans Standard Specifications and Standard Special Provisions for Plant Establishment Work.

## 14.5 Deliverables

### *14.5.1 Landscape and Irrigation*

The Landscape and Irrigation Concept Plan shall be submitted to the Department for Approval within 60 Working Days after the landscape and irrigation concept meeting. Irrigation Plans shall conform to Department standards and comply in concept with the Water Resources Department's draft model effient landscape ordinance (No.AB1881). Irrigation valves and components are to be located and clustered in locations safely accessible for highway maintenance workers.

### *14.5.2 Vegetation and Irrigation Plans*

The Design-Builder shall prepare and submit to the Department, landscape and irrigation plans. These plans shall be submitted for the Department's Acceptance prior to starting vegetation and irrigation construction activities.

### *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 and irrigation. 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*.

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

#### *14.5.3.1 Final Design Documents*

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

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

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

#### *14.5.3.2 Over-the-Shoulder Design Documents*

During the landscape and irrigation 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 Roadway RFC plans is required.

#### *14.5.3.4 Non- Standard Specifications and Non-Standard Special Provisions*

If the Design-Builder requests the Department's 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.

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# EXHIBIT 14-A

## Landscape Details

This exhibit 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; conducting and documenting a Visual Impact Assessment; and coordination with a Visual Quality Management Advisory Team, inclusive of key stakeholders; 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 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-10 Corridor Aesthetics Details (Exhibit 15-A) |

### *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 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 develop a Visual Quality Management Plan 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 Visual Quality Advisory Team; and the format and distribution of the ongoing VQM Advisory Team's "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 for requirements.

##### 15.2.4.1.2 Responsibilities

The Visual Quality Manager shall have the responsibility to:

- develop and implement the Visual Quality Management Plan;
- coordinate visual quality issues with the Visual Quality Advisory Team, the 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, or photo simulations 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 and (Permitting Agency as appropriate) Approval to deviate from the I-10 Corridor Aesthetics Details or 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 I-10 Corridor Aesthetics Details or Visual Quality Manual by Permitting Agency and the Department may take up to 60 Days to complete.

#### 15.2.4.2 Methodology

##### 15.2.4.2.1 Establishing a Visual Quality Advisory Team

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

- Local Agency Staff
- Department Bridge Architecture and Aesthetics representative(s)
- Department Landscape Architecture representative
- City of Baldwin Park, and local agency staff, as appropriate
- 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's 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 Advisory 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 Advisory 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 Advisory 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 how the opinions and judgments of the general public will be considered in the design solutions determined or recommended by the Visual Quality Advisory Team;
- Define how the opinions and judgments of elected officials will be incorporated into the design solutions determined or recommended by the Visual Quality Advisory Team;
- 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 Advisory 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's 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's 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.

### *15.2.6 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 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 Managemment Meeting*

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

The Design Builder shall use the meeting to determine the permanent Visual Quality needs of the Project.

## 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:

- Prepare an initial aesthetics plan based on criteria in this section.
- Develop a plan that integrates landscaping and aesthetic treatments.
- Design and construct aesthetic treatments that are aesthetically pleasing and fit the neighboring environment; and respond to the coordination with the cities along the alignment.

### *15.3.1 Visual Impact Assessment*

The Design-Builder shall become familiar with existing documents related to visual quality and provide copies to members of the Visual Quality Advisory Team. The Design-Builder shall determine, document, and summarize the existing visual quality of the affected natural, cultural, and Project environments as it would be defined by the affected population of neighbors and travelers. The Visual Impact Assessment shall conform to the requirements in the Standard Environmental Reference.

### *15.3.2 Corridor Aesthetics Details or Visual Quality Manual*

The Department has developed the I-10 Corridor Aesthetics Details for the Project, provided as Exhibit15-A. The Design-Builder shall conduct all Work in accordance with the I-10 Corridor Aesthetics Details.

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's 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 Visual Quality Manager, with advice and consent from the Department, shall develop construction documents based on the visual quality review process, as specified in the VQM and as reflected in the Record of Recommendations and Decisions.

If it is not clear to the Design-Builder how a visual quality decision or recommendation should be interpreted, the Design-Builder shall 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 whether the Design-Builder is interpreting a design decision correctly.

The following qualities shall be inherent in the design of the and build a Project:

- The new bridges shall be an integrated whole into the existing freeway corridor setting.
- The final design solutions shall result in an elegant simplicity in which the engineered lines and proportions are the primary design element.
- The design elements shall exhibit fluid lines in the overall presentation of the bridges.
- The designs shall consider the many and varied vantage points from which the bridges are viewed.
- The views, safety and sense of security for motorists, bicyclists, and pedestrians shall be considered in the design of the bridges.
- Care shall be given to create well-resolved transitions between varying materials; between different depths and types of superstructures; and at road width transition points.
- Touch-down points of approach bridges shall be well designed to blend into the adjacent landscape. Wall heights shall be minimized.
- The designs shall consider the appearance of the new bridges both during the day and at night. Architectural lighting shall be included in the design solution, and the roadway and pathway lighting shall be designed to meet required light levels and be an integrated part of the comprehensive design vision.
- Sign structures shall be designed to integrate well into the overall architectural vision.
- Utility and drainage conveyance systems shall be designed to minimize adverse visual impact and shall be well integrated into the bridge architecture. Drainage downspouts (when required) shall be integrated internally into towers and piers.
- If Mechanically Stabilized Earth retaining wall systems are included in the design, shape, pattern and texture of the face shall be designed to relate to the comprehensive architectural vision of the Project.

#### 15.3.3.1 Roadway Facilities

This section applies to all roadway facilities constructed as part of the Project, including mainline, ramps, turn lanes, shoulders, and other facilities that convey vehicular traffic.

The Design-Builder shall use the flexibility inherent in AASHTO, FHWA, and Caltrans highway design standards to avoid adverse impacts to existing visual quality and provide opportunities for enhancing visual quality in the Project corridor. In particular, the Design-Builder shall:

Coordinate the design of the highway, particularly its horizontal and vertical alignment and cross-section, visual harmony with the natural environment, visual order with the community setting, and design coherence within the highway corridor.

#### 15.3.3.3 Grading

This section applies to any disturbance of the existing landform or other modification; including any excavation (cutting) or embankment (filling) that alters the elevation of the existing landform.

The Design-Builder shall design and construct grading so as to establish visual continuity between the topography of the highway corridor and the topography of the adjacent landscape.

#### 15.3.3.4 Retaining Structures

Retaining structures shall be designed as part of a cohesive architectural vision and be complementary to the proposed bridge architecture. Retaining walls at bridge touch-down points shall be minimized and designed to blend into the existing landscape.

#### 15.3.3.5 Slope Protection

On any slopes that will receive sufficient sunlight and water to support plants, employ vegetative slope protection methods. On other slopes, employ materials, textures, patterns, and colors that will complement adjacent all visual quality elements and contribute to the overall aesthetic effect of the Project.

#### 15.3.3.6 Bridge Architecture

The bridges and all elements of the bridges shall be designed with a cohesive and comprehensive vision conforming to the existing architectural shapes and slopes within the corridor.

#### 15.3.3.7 Culverts

This section shall apply to all structures that traverse beneath a roadway, trail, driveway, or similar facility to convey something that would impede traffic if allowed to cross the road, trail, or driveway at grade.

The Design-Builder shall establish visual continuity between the design of culverts and their context. In particular, the Design-Builder shall design and build culverts and associated erosion control elements to minimize their visibility from the roadway.

#### 15.3.3.11 Signing

This section applies to all signs installed on Right of Way as part of the Project and maintained by the Department or other governmental agency, including regulatory, advisory, directional, service, logo, and attraction signs. In addition to requirements in Section 16, the Design-Builder shall use uniform sign panel heights when sign placement requires that more than one sign panel to be located on a signing structure.

#### 15.3.3.13 Utilities

This section applies to all above-ground Utilities, regardless of ownership, visible to neighbors or travelers, including Utility poles, overhead wires, and cabinets; to components of underground Utilities that are visible above ground, such as access covers, stormwater grates, and pump houses; and where below-ground Utilities will affect the visual quality of the corridor by compromising visual quality, prohibiting the installation of vegetation, or by adversely affecting existing vegetation.

The Design-Builder shall design and place Utilities 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 Department and the City of Baldwin Park, shall develop RFC plans for the Visual Quality Plans and Landscape Design Plans based on the requirements established by the Visual Quality Manual.

## 15.4 Construction Requirements

### *15.4.1 Visual Quality Mock-ups and Samples*

The Design-Builder shall provide mock-ups and/or samples for the items described in this 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.

#### 15.4.1.3 Slope Protection

The Design-Builder shall construct a mock-up for each type of slope protection.

#### 15.4.1.4 Bridges and Structures

The Design-Builder shall construct a mock-up for each type of retaining wall surface and for each type of superstructure exterior girder face.

#### 15.4.1.6 Lighting

The Design-Builder shall supply a sample of each lighting standard, fixture, and luminaries as indicated by the Visual Quality Manual.

## 15.5 Deliverables

Unless otherwise indicated, all deliverables shall be submitted in both electronic format and hardcopy format. Acceptable electronic formats include Microsoft Word, Microsoft Excel, or Adobe Acrobat (PDF) files, unless otherwise indicated. At a minimum, the Design-Builder shall submit the following to the Department:

| Deliverable | For Approval or Acceptance | Number of Copies | | Submittal Schedule | Reference Section |
|---|---|---|---|---|---|
| | | Hardcopy | Electronic | | |
| Visual Quality Management Plan | **Approval** | 3 individually bound full-color copies | PDF on 3 CDs | Submit within 60 days after issuance of NTP1 | 15.2.4.2.3 |
| Visual Quality Graphic Images, Drawings and Details | **Approval** | 3 full-color punched copies for binders | PDF | Distribute at Visual Quality Advisory Meetings | 15.3.2 |
| Visual Quality Mock-ups and Samples | **Approval** | Mock-ups – 1<br>Samples - 1 | PDF | Minimum 15 Days prior to construction | 15.4.1 |

### *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.

### *15.5.3 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 of lighting elements, each type of retaining wall surface, fencing, fence posts, parking lot screening, precast elements, colored concrete walks, bike racks, benches and trash receptacles, a minimum of 14 Days prior to the construction or installation of any of these elements.

# EXHIBIT 15-A

I-10 Corridor Aesthetics Details

This exhibit is provided as an electronic file.

# 16 LIGHTING AND SIGN LIGHTING

## 16.1 General

The Design-Builder shall perform all Work necessary to meet the requirements for temporary / permanent City Lighting and temporary / permanent freeway safety / sign lighting for the Project.

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

## 16.2 Administrative Requirements

### *16.2.1 Standards*

#### 16.2.1.1 General Standards

The Design-Builder shall design and construct 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 specified herein or modified by Addendum or Change Order.:

#### 16.2.1.2 [NOT USED]

#### 16.2.1.3 [NOT USED]

#### 16.2.1.4 [NOT USED]

#### 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 | April 2007 Signal, Lighting, and Electrical System Design Guide |
| 4. | Department | Special Provisions and Non-Standard Provisions |
| 5. | Department | Standard Plans |
| 6. | Department | Design-Build Modifications to the Standard Specifications |
| 7. | Department | Standard Specifications |
| 8. | Various | Technical Memoranda |
| 9. | Department | Plans Preparation Manual |
| 10. | ANSI | Illuminating Engineering Society of North America Roadway Lighting ANSI Approved |
| 11. | AASHTO | Roadway Lighting Design Guide |

12. NFPA National Electrical Code 2005

*Document modified for design-build.

### 16.2.2 References

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

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

### *16.2.3 Local Road System*

The Design-Builder shall design and construct all local street lighting improvements in accordance with the applicable [local agency] standards, specifications and requirements within these technical provisions.

### 16.2.4 Preliminary Engineering Documents

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

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

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

### 16.2.5 Software Requirements

The Design Builder shall at its own discretion use any software when submitting plans for approval but shall prepare final drawings in MicroStation V8 or the latest version available upon agreement from the engineer.

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) working days prior notice of such meetings. The Design-Builder shall prepare and distribute within five (5) working days of the meeting a record of the minutes to the meeting.

**16.2.7 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 [NOT USED]

**16.3.2 [NOT USED]**

16.3.3 [NOT USED]

**16.3.4 [NOT USED]**

**16.3.5 [NOT USED]**

### *16.3.6 Electrical Design*

**16.3.6.1 Electrical Design Concept Meeting**

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

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

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

A separate electrical service cabinet shall be provided for the city circuits.

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

### *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 concept meeting to present a layout of the in-place and proposed lighting system on the Project to the Department.

The Design-Builder shall use the outcome of the meeting to finalize the lighting system needs of the Project.

#### 16.3.7.2 Photometric Analysis

The Design-Builder shall complete a Photometric Analysis that includes the following:

- Lighting intensities and uniformity, light pole locations and heights, luminaire types, wattage and brightness, and quantities of each
- Lighting calculations accounting for the anticipated loss of light due to lamp lumen depreciation (LLD) and lamp dirt depreciation (LDD)

- When adjacent to residential areas, the maximum spillover lighting allowed shall be 0.2 foot-candles at ground level on residential properties
- Consideration of roadway safety, ease and cost of maintenance, cost of construction, consistency with adjacent roadway lighting designs, annual energy costs, and provision for future lighting needs and local planning policies
- Lighting distances from the light source at the following lighting levels: 1.0 foot-candle, 0.5 foot-candle, and 0.2 foot-candle for all edges of pavements, shoulder lines, lane lines, Right of Way, and 150 feet outside of Right of Way

The Design-Builder shall consider, but not to required to use the three dimensional aspects of the roadway with respect to the positioning of the illumination assemblies (i.e., roadways, ramps, overpasses, etc., are typically at varying vertical and horizontal distances from the 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 illuminance 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 design all new permanent lighting systems to be 120/240 volts. The Design-Builder shall consider locations of nearby guardrail, noise walls, retaining walls, utilities, and overhead power lines when placing light poles. The Design-Builder shall install electroliers with slip bases within the recovery clear zone unless otherwise protected by MBGR or concrete barrier.

The Design-Builder shall design all temporary lighting system to comply with the same design and construction requirements of the permanent systems.

- Type 1 conduit shall be used unless otherwise specified.
- The minimum trade size of conduit from an electrical service cabinet to the adjacent pull box shall be two 3-inch
- All roadway lighting fixtures which are going to be connected to the State owned electrical service cabinet shall be the LED type (Light Emitting Diode Luminaire).

- For the Department lighting system only: Pull boxes to be installed in the structure shall be Type 9. The pull box lid shall be wire theft-resistant type. The installation method of the pull boxes at location other than in the structure shall follow the recommendation of the wire theft-resistant pull box lid manufacture. Since this type of pull box lids are not the standard items for the Department, the Design Builder shall first obtain the necessary technical information, such as specification, shop drawing, and provision, etc., from the pull box lid manufacturer and submit to the Department for approval. See Section 16.5.9 for the Non-Standard Special Provision approval process. The wire theft-resistant pull box lids can be obtained at the following manufacturers,

  **Case Automation Corp**
  5920 Rickenbacker Ave
  Riverside, CA 92504
  951-637-6666
  951-202-7088
  Don Nielsen

  **Elite Machining Inc**
  2050 S Del Rio
  Ontario, Ca 92176
  951-271-0318
  Tyler Peterson

  **ERC, Inc**
  2970 E Maria St
  Rancho Dominguez, Ca 90221-5819
  310-603-2970
  Mike Coy

### 16.3.7.6 High Mast Lighting

High mast lighting shall not be used on this project.

### 16.3.7.7 Electrical Service

Intersection safety lighting shall be in accordance with the Department Standards.

Service for all elements shall be standard 120/240-volt (V) service. The Design-Builder shall be responsible for obtaining new or modified electrical service and telephone service points, including all applications and permits required from the serving utility company, and XY standard forms in the case of new telephone services. The Design-Builder shall refer to the Utilities section in the technical provisions for utility requirements.

Separate service conduits shall be used for lighting circuits, Traffic Monitoring Systems (TMS), 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 Final Acceptance.

The Department shall pay for existing power for the mainline and ramp lighting as long as the existing lighting is in use. Notify the Department at least seven (7) 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.

Local agencies shall pay for power for lighting at the signalized intersections. Notify them at least seven calendar days before disconnecting the power. The Design-Builder shall provide temporary lighting for each signalized intersection and pay the temporary lighting costs until the final lighting facilities are in place and have been accepted. Local agencies will then resume payment responsibility for power for lighting.

#### 16.3.7.8 Arterial Streets and Frontage Roads

Provide lighting on signalized intersections located on all arterial streets, and frontage roads within the Project limits. Provide standard roadway 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

The Design Builder shall light all overhead sign structure on the freeway. 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.

## 16.4 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 [NOT USED]*

#### 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 [NOT USED]*

### *16.4.3 NOT USED]*

#### *16.4.3.1 Source of Power*

The Design-Builder shall coordinate with the local power supplier to provide the power service connection. The Design-Builder shall pay all costs, unless otherwise noted, charged by the electric power companies for providing power connections. The Design-Builder shall be responsible for contacting the electric utility to determine the source of power, to obtain exact locations of power poles and stub-outs for the permanent and temporary installations.

### *16.4.4 Temporary 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 s will receive a response within 15 days.

#### *16.4.42 Lighting*

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

#### *16.4.4.3 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.

## 16.5 Deliverables

The Design-Builder shall develop Released for Construction (RFC) Documents, As-Built Plans and Final Design Documents I accordance with the requirements of these technical provisions.

### *16.5.1 Lighting Concept Plan*

The Lighting Concept Plan (permanent or temporary) with incorporated comments received at the Lighting Concept Meeting shall be submitted 60 days after the concept meeting.

### *16.5.2 Electrical Concept Plan*

The Electrical Concept Plan (permanent or temporary) with incorporated comments received at the Electrical Concept Meeting shall be submitted 60 days after the concept meeting.

### *16.5.3 Signing Concept Plan*

The Signing Concept Plan (permanent or temporary) with incorporated comments received at the Signing Concept Meeting shall be submitted 60 days after the concept meeting.

### *16.5.4 Over-the-Shoulder Design Documents*

During the design process, any submittals required in the Design Standards or other Contract Documents shall be prepared and submit 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 Caltrans 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) working 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*

The Department has provided lighting and sign lighting Non-Standard Special Provisions (NSSPs) examples in the Reference Information Documents for the design and construction of the lighting and sign lighting system. These lighting and sign lighting 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 lighting and sign lighting NSSPs examples provided in the Reference Information Documents are not utilized by the Design-Builder for design and construction of the lighting and sign lighting 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 methods or materials are not part of the Department standards, the Design Builder shall submit a request to the Department for approval prior to the field installation. The submittal shall include shop drawings, 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). The Design-Builder shall take an inventory of all the existing ITS elements in the Project. The Design-Builder shall design and construct the Work of 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, and system acceptance of ITS.

The Design-Builder shall coordinate with the local agencies to ensure that the appropriate design methods, procedures, submittals, plan preparation, analysis methodology, review/comment processes, approval procedures, specifications and construction requirements are met for ITS work within the Project

## 17.2 Administrative Requirements

### *17.2.1 Standards*

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

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

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

**Intelligent Transportation Systems Standards and Requirements**

| Priority | Agency | Title |
|---|---|---|
| 1 | Department | Traffic Manual |
| 2 | Department | Standard Plans |
| 3 | Department | Design Build Modifications to the Standard Specifications for Construction |
| 4 | Department | Standard Specifications |
| 5 | Department | Construction Manual |
| 6 | Department | Technical Memoranda and preliminary engineering documents |
| 7 | Department | Plans Preparation Manual |
| 8 | AASHTO | Roadside Design Guide |

### *17.2.2 References*

Use the references listed below as supplementary guidelines for the design and construction of the ITS system as appropriate.

| *ITS References* | *Agency Title* |
|---|---|

| | |
|---|---|
| Department | Transportation Electrical Equipment Specifications (TEES) |
| Department | Ready to List and Construction Contract Award Guide (RTL Guide) |
| NEC | National Fire Protection Agency National Electric Code (NEC) Standards, including Listing Requirements |
| U.S. Department of Of Transportation | National ITS Architecture |
| NEMA | National Electrical Manufacturers Association (NEMA) Standards |
| EIA | Electronics Industries Alliance (EIA) Standards |
| TIA | Telecommunications Industries Association (TIA) Standards |
| NTCIP | National Transportation Communications for ITS Protocol (NTCIP) Standards |
| ITE | Institute of Transportation Engineers (ITE) Standards |
| EIA/TIA | Fiber-Optic Test Procedure (FOTP) Standards |
| USDA | United States Department of Agriculture (USDA) Rural Utilities Service (RUS) Specifications |

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

### *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 designing plans for approval but shall prepare final drawings in MicroStation V8 or the latest version available upon agreement from the engineer.

Design-Builder shall use ITS devices that are compatible with the data requirements of the Department District 7 Los Angeles Regional Transportation Management Center (LARTMC), Automated Traffic Surveillance and Control (ATSAC) systems software. Due to new technology updating so rapidly, the Design-Builder shall meet with LARTMC Engineers to inquire about the software currently being used to ensure Project conformity.

### *17.2.5 Meetings*

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

### *17.2.6 Certification Requirements*

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

### *17.2.7 Coordination with Other Agencies and Disciplines*

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

### 17.2. 8 Department Responsibilities

The Department responsibilities are as follows: Recommending Approval or disapproval of components and/or methods; Reviewing the documentation and certification of test device calibration (to ANSI specified guidelines which call for an annual calibration of test equipment) used to measure the following:

- Electrical characteristics of power and signal control cables.
- Insulation characteristics of power and signal control cables.
- Optical cable test equipment.

Making recommendations for the Approval of documentation, test results, and submittals. Reviewing and making recommendations for the Acceptance of the required documentation for the following items related to the system:

- Specifications.
- Shop drawings.
- Measured and recorded values.

Be present when the following ITS component locations are staked or flagged:

- F/O cable.
- Splice vaults.
- Pull boxes
- CCTV Cameras and poles.
- Cabinets.
- Changeable message sign pole.
- Highway advisory radio antenna pole.

## 17.3 Design Requirements

### *17.3.1 ITS Concept Meetings*

The Design-Builder shall schedule and participate in ITS concept meetings to present layouts of the existing and proposed ITS system on the Project. The Design-Builder shall be responsible for determining the number and location of all affected ITS elements. The Design-Builder shall document this information, along with preliminary quantities. Existing ITS element sites shall be relocated to accommodate the roadway widening.

At the ITS concept meeting, the Design-Builder shall present a functional ITS design with hardcopy layouts. The ITS concept meeting shall include proposed approaches for and discussion of the following topic areas:

- Preliminary plan for maintaining surveillance during construction

- Fiber-optic cable/conduit location
- Splice vault /Pull box locations
- Cabinet locations
- Fiber-optic cable splicing and testing
- Locating ITS elements (ramp metering systems, traffic monitoring stations/count stations, CCTV cameras, changeable message signs, and highway advisory radio) and Maintenance Vehicle Pullouts (MVPs)
- Salvaged items
- Worker certifications
- Component testing (wire tests, loop detector testing)
- Test equipment calibration
- DocumentationTemporary ITS elements
- Review ITS systems and operations, including field verification of all legacy ITS systems and elements
- Define and finalize ITS functional, technical, operational, and maintenance requirements
- Finalize goals and parameters of ITS design
- Establish integration requirements
- Develop Acceptance of ITS design
- Address and discuss ITS construction issues

The Design-Builder shall submit the proposed Testing Plan. This meeting shall occur prior to any testing. Testing personnel, including the people that will be performing the field-testing shall be required to attend the meeting. The Design-Builder shall notify the Department prior to F/O system testing. the Department may observe each test.

### *17.3.2 General Requirements*

The ITS design shall provide for fiber-optic communications, real-time National Television System Committee (NTSC) closed circuit television (CCTV) surveillance, operations data collection (loop detection), and motorist information features along the entire corridor on I-605 from cable node at I-210 and I-605 to San Gabriel Hub. The Design-Builder shall provide 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
- Two-4 inch conduits for trunk line (one enclosed cables and one spare).
- Consistent cabinet layouts throughout field device locations
- Support stand-alone operation of all field devices using backup software components
- Protection from voltage surges and lightning
- Weather-resistant elements capable of operating in rain and wind conditions and in temperature and humidity ranges encountered in the Project area
- ITS elements that are considered as the fixed objects should be installed outside the clear zone. The Design-Builder shall design all temporary roadway facilities to comply with the same design and construction requirements as that of the permanent roadway facilities.
- If ITS elements being considered as the fixed objects cannot be installed beyond the clear zone, they shall be constructed and protected per AASHTO Roadside Design Guide, Caltrans *Highway Design Manual* and *Caltrans Standard Plans*.

HDM and Department 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 CCTV Camera, Changeable Message Sign, Highway Advisory Radio, Ramp Metering System, and Traffic Monitoring Station/Count Station, and the poles of CCTV Camera and Highway Advisory Radio antenna.

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 legacy system.

#### 17.3.2.1 Los Angeles Regional Transportation Management Center (LARTMC)

The LARTMC's primary purpose is to integrate the Department's District Maintenance Dispatch and the Department's Division of Operations with the California Highway Patrol Dispatch into a unified command center. The integration provides the communications and computer infrastructure necessary for coordinated transportation management on freeways during normal commuting periods, as well as during special events and major incidents. The LARTMC serves as a central point for collecting, verifying, processing, and distributing real-time transportation information throughout the District Project area. Information will be collected using various ITS components, including such roadside devices as closed circuit television cameras, ramp metering systems, traffic monitoring stations/count stations, changeable message signs, and highway advisory radio.

The data signals received at the LARTMC shall be configured to be integrated with the existing ATMS system processing hardware and software to enable operators to communicate with any CCTV camera, changeable message sign, traffic monitoring station/~~(~~count stations~~)~~, highway advisory radio, or ramp metering on the corridor and without affecting the existing system.

#### 17.3.2.2 Communication Hub Buildings

All fiber-optic and communication circuits shall be furnished and installed so that video and control communications shall follow two (2) paths: primary and backup. The primary path shall be designed and configured to route the signals to the existing San Gabriel (SGV) Communications Hub. The backup path shall be designed and configured to route the signals to the existing North Hollywood (NHD)Communications Hub. These two paths shall be routed to the LARTMC. The network shall be designed and configured in such a manner that if the primary circuit fails for any reason, the backup circuit shall automatically assume the primary role. When the primary circuit is restored, the communications network shall switch the communications transport function back to the primary circuit. The fiber-optic and communication circuits from the hubs to the LARTMC shall be provided to the Design-Builder by the Department to complete the circuits to the LARTMC.

The Design-Builder shall provide necessary video and data equipment matching the video and data equipment units installed at the video node and data node, connecting wires and cables, and other equipment necessary to make the system fully operational.

The Design-Builder shall design project so as to maintain current access to San Gabriel Hub.

### *17.3.3 Permanent Traffic Control*

#### 17.3.3.1 Ramp Metering Systems (RMS)

Refer to Section 26 entitled "Ramp Metering" for requirements.

#### 17.3.3.2 Traffic Monitoring Stations/Count Stations (TMS/CS)

The Design-Builder shall relocate and modify traffic monitoring 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 high occupancy 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 TMS/CS's to make the system fully operational.

### *17.3.4 Permanent Traffic Surveillance*

#### 17.3.4.1 Closed Circuit Television (CCTV) System

##### 17.3.4.1.1 Closed Circuit Television (CCTV) camera

The Design-Builder shall furnish and install new CCTV hardware at locations. CCTV hardware shall be placed such that the intersecting arterial is viewable and maintenance access is available.

The Design-Builder shall consult on the placement of CCTV hardware during the design progress meetings. Camera views, accessibility, and maintainability are issues of concern and the Design-Builder shall obtain input from for approval.

The Design-Builder shall provide a CCTV system that meets the following requirements:

- New CCTV camera equipment
- MVP or Department Standard adjacent to the CCTV pole
- Cabling
- Coverage to remotely monitor highway and/or connecting arterial street traffic conditions and confirm messages displayed on changeable message signs within Project area
- Placement to allow monitoring of ramp metering and ramp queues, where applicable
- Maintenance-free, to the extent possible
- Poles and cameras shall not be placed in the median of the highway
- CCTV system shall be compatible with the current video switch in the Hub buildings and Los Angeles Regional Transportation Management Center
- Lightning and surge protection

The Design-Builder shall determine new camera locations based on proximity to existing cameras affected by construction activity. The Design-Builder shall make a 5-minute video of the field review at the proposed location/height of all CCTV cameras. The video shall demonstrate the camera's ability to zoom in and out and pan up and down. The video shall be reviewed to approve or disapprove the location and mounting height as applicable.

Work shall consist of furnishing and installing the following:

- A CCTV camera assembly on a standard CCTV pole,
- Camera control circuits, and accessories.
- CCTV wiring, including connectors, composite video cables, connectors and coaxial cables,
- Fiber optic equipment.

The CCTV camera assembly shall be supplied as a fully-assembled, integrated, tested and configured single unit from the manufacturer at the camera manufacturer facility and shall be delivered to the project site accompanied with a written certification of assembly and configuration from the camera manufacturer. This certification shall serve as the manufacturer documentation that the assembly and configuration of the camera/lens/housing equipment were performed. A sample certification document shall be furnished as part of the materials submittal data. CCTV Camera Assembly Communications Specifications:

- Serial data communications ports conforming to EIA/TIA-232 and EIA/TIA-422
- Configurable to support NTCIP 1205 - NTCIP Objects for CCTV Camera Control
- Via the CCTV protocol, the user shall be able to obtain camera position information including tilt angles, pan positions and zoom levels. The information shall be supplied as 0-359° Azimuth and -95° to +95° Elevation

Before installation and after installation, the Design-Builder shall test to verify that all new CCTV camera assembly equipment functions in accordance with the manufacturer's specifications. After installation, new CCTV camera equipment shall be tested at each individual location. The Design-Builder shall install and fully adjust the CCTV camera assembly with the associated components, power supply, and all necessary cabling and incidental equipment to make the CCTV camera assembly completely operational. All CCTV camera assembly components shall be fully interchangeable. All CCTV camera equipment installed shall be warranted for a minimum of 1 year from time of final acceptance test, or 2 years from date of delivery, whichever is longer. The period of warranty coverage shall not be less than the manufacturer's warranty period.

#### 17.3.4.1.2 CCTV Poles

The Design-Builder shall furnish and install CCTV poles for all the relocated CCTV camera sites.

### *17.3.5 Traveller Information*

#### 17.3.5.1 Changeable Message Signs (CMS)

The Design-Builder shall determine when an existing Changeable Message Sign (CMS) is affected by construction activity and relocate the affected CMS system to the new location as required on this project. The Design-Builder shall furnish and install necessary equipment for all CMS's to make the system fully operational.

#### 17.3.5.2 Highway Advisory Radio (HAR)

The Design-Builder shall determine when an existing Highway Advisory Radio (HAR) is affected by construction activity and relocate the HAR system to the new location as required on this project. The Design-Builder shall furnish and install necessary equipment for HAR to make the system fully operational.

### *17.3.6 Communication Network*

The Design-Builder shall utilize the existing SONET 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 and 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 and communications system network to serve the ITS elements along the entire corridor on I-605 from cable node at I-210 and I-605 to San Gabriel Hub .
- Provide F/O Communication Network cables which shall include one 50 pair 22 copper cable, one 48 single mode fiber optic cable for TMC intertie, and 12 single mode fiber optic cables for the ITS elements.
- 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 CCTV camera, traffic monitoring 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 will be rerouted. The Design-Builder shall minimize the number of transverse crossings of the freeway. The Design-Builder shall place the armored fiber-optic 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 0.483-meter (19-inch) EIA rack with brackets available to accommodate a 0.584-meter (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 0.127-meter (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 0.483-meter (19-inch) EIA rack with brackets available to accommodate a 0.584-meter (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 0.127-meter (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” long by 30” wide by 30” deep (1520 mm X 760 mm X 760 mm).
- Cover markings shall be labeled "CALTRANS COMMUNICATION" on each cover section.
- Cover shall support a minimum force of 100 lb-force.

#### 17.3.7.1 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 6900 MPa (1 x 10 E6 psi).
- Compressive strength of greater than 62.1 MPa (9000 psi).
- Flexural strength of greater than 20.7 MPa (3000 psi).
- Impact Energy of greater than 22.2 J (30 ft-lb), and Tensile strength of at least 5.5 MPa (800 psi).

The communication pull box shall have the following physical characteristics:

- Outside dimensions of 42” long by 26” wide by 42” deep (42.625”x26”x42”),
- An open bottom.
- An approximate weight of 96.2 kg (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 905 mm by 610 mm by 76 mm (35.625x24x3 inches),
- Weighs 38.6 kg (85 lbs.),
- Two 0.375-16 UNC stainless steel hex head bolts with washers.
- Two 13 mm (0.5 inch) by 102 mm (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*

The Design-Builder shall ensure that all equipment, devices, interconnect wiring, communication devices, communication lines, power supplies, antennas, operator controls, and power service are protected from external and internal sources, including power surges, lightning, induced voltages, and static discharge. All cables shall be UV stale. The Design-Builder shall design a grounding system and protection devices suitable for the specific installation and equipment being supplied.

**17.3.8.1 Conduit, Innerduct and Communication Conduit**

The Design-Builder shall furnish and install two-4 inch communication (non-metallic) conduits (one enclosed cables and one spare), 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 inches wide underground warning tape of "CAUTION BURIED FIBER OPTIC CABLE BELOW – CALL CALTRANS (323) 259-1922" 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. Refer to specifications described on Communication Conduit Trench Details plans include in the Preliminary Engineering Documents for more details

#### 17.3.8.2 Electrical Service

Unless otherwise specified, the Design-Builder shall provide 120v/240v electrical power to each location as necessary. The Design-Builders shall be responsible for the application for electrical service and all costs associated with utility hook-up charges and components installed by the utility company.

#### 17.3.8.3 Coordination with Power Utility

The Design-Builder shall coordinate with the Utility to request to shut off or turn on the service during construction period if needed. Design-Builder shall be responsible for obtaining new or modified electrical service points, including all applications and permits required from the serving utility company. Separate service conduits shall be used for Traffic Monitoring Systems (TMS), Ramp Metering Systems (RMS), CCTV cameras, and from the service meter cabinet to the load. Electrical service cabinets shall be placed off the freeway. Design-Builder shall be responsible for all electrical Utility costs following any change in loading on an existing meter, or installation of a new meter. This responsibility shall continue until Final Acceptance.

## 17.4 Construction Requirements

The Design-Builder shall design the ITS system as a whole and receive Approval before installation of any individual field element. The Design-Builder shall make final connections of the newly installed or

temporary ITS elements to the existing system. Three Working Day advanced notification to Department and LACMTA 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 communication system (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 CCTV hardware, cabinets, and equipment. The Design-Builder shall provide *x, y, z* coordinates on the installed ITS elements and on existing elements where the new elements connect to them:

- Loop detectors
- Pull boxes
- Control cabinets
- CCTV Camera poles
- Fiber-Optic and communications cables
- Fiber-Optic pigtails
- Splice vaults/Communication pull boxes

The Design-Builder shall also provide coordinate correct As-Built drawings. The As-Built drawings shall use the Released for Construction design drawings used for construction with all deviations of components from their original design placements redrawn and shown in their coordinate correct location. As-Built drawings shall contain standard line styles and component symbols used for ITS design. Construction shall be in accordance with the requirements of the Standard Specifications and the Special Provisions.

#### 17.4.1.1 Allowable Working Hours on the ITS System

All ITS elements outside the Planned Right of Way limits shall not be affected by the Design-Builder and remain operable during construction of the Project. The Design-Builder shall be restricted to only work on the active part of the system from 9:00 a.m. to 3:00 p.m. and 7:00 p.m. to 6:00 a.m. Notification from the Design-Builder shall be required prior to taking down active system elements. The Design-Builder shall perform all work in a matter ensuring the integrity and proper performance of all ITS elements during these hours. A 48 hours notification is required prior to performing any work on existing/active ITS devices.

#### 17.4.1.2 Repair Parts

The Design-Builder shall have repair parts available during construction for all ITS elements.

#### 17.4.1.3 Materials and Fabrication

The Design-Builder shall round and smooth sharp corners and edges on all ITS elements that are furnished and installed.

#### 17.4.1.4 Locates

The Design-Builder shall be responsible for all underground cables placed by the project until Final Acceptance of the project.

### *17.4.2 Ramp Metering System*

RMS shall be relocated and modified at new locations and shall comply with *Caltrans Highway Design Manual*.

#### 17.4.3.1 Closed Circuit Television (CCTV) System

The Design-Builder shall furnish and install the CCTV hardware. Notification from the Design-Builder shall be required when the installation of the CCTV hardware is complete. The Department shall work with the Design-Builder and be present to approve the locations for the CCTV pole foundation and the 334 TV cabinets in the field before the foundations are placed. Design-Builder will furnish and install the CCTV camera assemblies at each of the CCTV hardware locations.

##### 17.4.3.1.1 Video/Control Cable for Camera

The Design-Builder will furnish and install the camera video/control/power combination cable from the CCTV pole box to the top of the pole. All CCTV shall be installed behind a protective barrier. The Design-Builder shall provide a flat pull strap within the CCTV pole to facilitate installation of the CCTV communication/video/power combination cable from the CCTV pole box to the top of the pole.

##### 17.4.3.1.2 CCTV Pole Foundation

The Design-Builder shall furnish and install foundations for CCTV poles that comply with *Caltrans Standard Plans, May 2006*, Sheet ES-16A.

##### 17.4.3.1.3 Maintenance Vehicle Pull Out Adjacent to CCTV Camera Site

The Design-Builder shall construct a maintenance vehicle pull out at each CCTV camera site. The Design-Builder shall locate a 1-meter (3-foot) by 1-meter (3-foot) by 0.100-meter (4-inch) sidewalk under the CCTV pole crank opening and another under the CCTV cabinet location

##### 17.4.3.1.4 Salvage Components

The Design-Builder shall salvage all CCTV camera assemblies and CCTV poles removed for construction purposes.

#### 17.4.3.2 Loop Detectors for RMS and TMS/CS

Exact locations for all loop stations shall be determined in the final design phase of the Project. A loop detector station shall be placed as close to the existing locations. These mainline stations shall be "count loop" detection with a single set of loops for all mainline roadway lanes. When installing queue detection loops, the Design-Builder shall evaluate the site conditions. Approval is required if the distance from the ramp meter varies more than 16.4 feet.

***Splicing an Existing Lead-in Cable to a New Detector Loop*** The Design-Builder shall verify that existing loop identification markings (lane and cabinet identification) are correct prior to cutting the splice to the lead-in cable. The Design-Builder shall splice the existing lead-in cable to the new detector loop. The Design-Builder shall provide a notification following the installation of the splice.

***Testing and Setting Up the Loop Detector Installation*** The Design-Builder shall set up the loop detector card. The Design-Builder shall be responsible for notifying when the loop and lead-in wire are ready for termination and testing.

***Terminating Lead-in Wires in the Cabinet*** Detector loop lead-in cables shall be terminated on the compression terminal block in the control cabinet. The Design-Builder will terminate the loop lead-in cable.

### *17.4.4 Communication Network*

The Design-Builder shall furnish and install materials and equipment such that ITS communications components are composed of identical sub-components. Identical sub-components shall be defined as components of the same manufacturer, model, and installation configuration. The ITS communications sub-components include the following:

- Fiber-optic and communications system cables
- 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 the 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 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.

### *17.4.4.9 Twisted Pair Cable*

The Design-Builder shall supply and install twisted pair cables to replace existing twisted pair cables. Twisted pair cables shall meet the requirements of RUS Specification PE-39. Conductors shall consist of a solid wire of plain annealed high concductivity copper, smoothly drawn, circular in section, uniform in quality, free from defects and having a conductor size number 22AWG. Conductor shall be insulated with a colored, high-density polyethylene jacket. Insulated conductor shall be uniformly twisted to form pairs.

#### 17.4.4.10 Twisted Pair Cable Installation

The Desigin Builder shall install cables in conduits. A manufacturer recommended lubricant shall be applied to cables to reduce friction between cables and conduits. Cables shall not be stressed beyond the minimum-bending radius. Tension limits shall be set at or below the manufacturer's maximum limit. The Design Buider shall provide a single loop of cable with a minimum length of 10 feets at each pull box and 40 feets for unspliced cables at splice vaults.

#### 17.4.4.11 Twisted Pair Cable Testing

The Design-Builder shall provide testing and documentation required to establish approval and acceptance of cables, installation and operation during the system integration testing. Cable shall be tested at the factory to ensure the cable complies with the manufacturer's specifications. The Design-Builder shall measure continuity and insulation resistance of cable pairs in each length of cable after installation and record and submit the results to the engineer.

#### 17.4.4.12 Twisted Pair Splice Closure

The Design Buider shall install twisted pair splice closure inside communications pull boxes or splice vaults for drops from twisted-pair trunk cables to equipment locations and at mid-span splices as shown on the plans. Closure shall protect cable splices from water and mechanical damage and shall be resistant to salt corrosion. Twisted pair splice closures shall be waterproof, encapsulated with re-enterable material and shall be sealed with gaskets.

### *17.4.5 Traveler Information*

#### 17.4.5.1 Changeable Message Signs

The Design-Builder shall relocate the existing changeable message signs when they are necessary. The Design-Builder shall be responsible to determine the new locations for the relocated changeable message signs and design to make the systems functional and operational.

#### 17.4.5.2 Highway Advisory Radio

The Design-Builder shall relocate the existing highway advisory radio when it is necessary. The Design-Builder shall be responsible to determine the new location for the relocated highway advisory radio and design to make the system 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 pull box 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.

### 17.4.7.1 Ground Rods and Ground Rod Connections

The Design-Builder shall furnish and install ground rods and ground rod connections with the following requirements: The ground rod shall be 4.6 m (15 feet) long, one piece, and comply with *Caltrans Standard Specifications*. An oxide inhibitor shall be applied over bonded connections to ground rods. The Oxide Inhibitor shall

- Be UL listed
- Provide an airtight seal around the conductor and ground rod,
- Be applied to the bonded area between the temperatures of -22 °C (-30 °F) and 149 °C (300 °F),
- Be used on copper conductors,
- Prevent oxides from forming, and
- Be mineral oil based

The Design-Builder shall bond the ground conductor to the ground rod by one of the following three bonding methods:

- Compression.
- Exothermic Welding is used when grounding TMS Shelters, CCTV poles and CMS structures with lightning braid.
- Irreversible compression is used when grounding TMS Shelters, CCTV poles and CMS structures with lightning braid. The irreversible compression bond is achieved by:
    - Using a hydraulic press with a connector die.
    - Using a solid copper connector with a run for a 5/8 inch ground rod and a tap for the specified ground conductor.

- Using connectors that can accommodate a conductor range from No. 6 solid copper through 500 Kcmil, are pre-filled with an antioxidant compound, and are strip sealed.

The Design-Builder may propose other methods and materials for implementing an irreversible compression bond and submit the associated products and procedures of equal quality for Approval.

### *17.4.8 Conduit, Innerduct and Communication Conduit*

The Design-Builder shall not direct-bury fiber-optic or communications system 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 and communications system 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's 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's 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's 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 to Specifications and Provisions that are not the Department standards, such request shall include comprehensive specifications and provisions associated with the proposed non-standard methods or materials. The NSSP approval process for ITS NSSPs requires a minimum of four weeks for review and approval.

#### 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 unless 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 |
| 4 | Department | Standard Special Provisions |
| 5 | Department | 2006 Revised and New Standard Plans |
| 6 | Department | Standard Plans |
| 7 | Department | Design-Build Modifications to the Standard Specifications |
| 8 | Department | Standard Specifications* |
| 9 | Department | Highway Design Manual* |
| 10 | Department | Plans Preparation Manual |
| 11 | Department | Traffic Manual, Chapter 7 |
| 12 | Department | CADD User Manual |
| 13 | AASHTO | A Policy on Geometric Design of Highways and Streets, |
| 14 | AASHTO | Roadside Design Guide, 3rd Edition |
| 15 | Department | Ramp Meter Design Manual |

*Document modified for design-build.

### *18.2.2 References*

Use the references listed below as supplementary guidelines for Maintenance of Traffic. These publications have no established order of precedence.

**Maintenance of Traffic References**

| **Agency** | **Title** |
|---|---|
| TRB | Highway Capacity Manual |

### *18.2.3 Traffic Management Plan*

The Design-Builder shall develop, implement, and maintain a Traffic Management Plan (TMP) that includes the following items:

- Descriptions of the duties of the Traffic Engineering Manager, Traffic Control Supervisor and other personnel with MOT responsibilities.
- A Traffic Management Plan Checklist completed under the direction of the Traffic Engineering Manager. See attachment 18-A.
- Procedures to identify and incorporate the needs of emergency service providers, law enforcement entities, local governments and agencies, and other related corridor users.
- Procedures to address special circumstances such as equipment malfunctions, traffic incidents, and special events.
- Procedures to modify the TMP as needed to adapt to current Project circumstances.
- Procedures to communicate TMP information to the Design-Builder's public information personnel, the Department's Public Information Office, and notify the public of Maintenance of Traffic issues in conjunction with the requirements of Book 2, Section 3.

### *18.2.4 MOT Task Force*

#### 18.2.4.1 Membership

The Design-Builder shall establish a MOT task force, inviting representatives of the Design-Builder, Department, Cities, Counties, law enforcement agencies, emergency response providers, and other agencies whose operations affect or are affected by the Project MOT plans.

#### 18.2.4.2 Meetings

The Design-Builder shall schedule and chair MOT task force meetings once a month from NTP2 to Project completion. The meeting schedule and frequency may be adjusted upon the agreement of the MOT task force members. The purpose of the meetings shall be to:

- Review and refine the TMP and its implementation.
- Review and refine the Design-Builder's MOT plans, specifications, and details,
- disseminate MOT information to task force meeting attendees,
- Determine additional membership invitees affected by the MOT as needed.

The Design-Builder shall deliver to the Department a list of all parties invited to take part in the MOT task force and the responses to all the invitations. The Design-Builder shall also take meeting minutes and distribute them to the task force members within 3 working days of the meeting.

## 18.3 Design Requirements

The Design-Builder shall use the procedures in the TMP to develop plans, specifications, and details to address all construction related traffic control issues. This includes construction area signs, stage construction, traffic handling, and detours.

### *18.3.1 Project Specific Requirements* **[**

The Design-Builder shall design the maintenance of traffic plan in accordance with the Lane Closure Charts (Exhibit 18-A) and also in accordance with the following requirements:

a. The I-10 and I-605 mainlines closures shall not be concurrent

b. While in operation, the traveled way for all freeway mainlines, connectors, on-, and off-ramps shall maintain the following minimum widths:

| Inside Shoulder | HOV Lanes | Mixed-use Lanes | Outside Shoulder |
|---|---|---|---|
| 2'-0" | 11'-0" | 11'-0" | 2'-0" |

Any additional lane closures shall be submitted to the Department for approval. Department will have 5 Working Days to review the request.

The Design-Builder shall incorporate the detour routes for on-ramp, off-ramp, and connector closures 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 5 Working Days to review the request. It is the Design-Builder's responsibility to contact and obtain approval from local agencies for detours on roads or streets under their jurisdiction.

The Design-Builder shall provide Sign Details plans showing how to fabricate any sign not detailed in the CA MUTCD. This includes sign dimensions, message, lettering sizes, and colors.

To minimize impacts to the testing and operation of the I-10 Express Lanes, lane closures will not be allowed during certain periods. These periods are Monday to Friday during the hours of 5 AM to 9 AM and 4 PM to 7 PM, in both directions of the I-10 freeway, between the I-710 and the I-605 freeway. Testing of the Express Lanes in this corridor is anticipated to start on November 1, 2012 and it would last for a period of one year. Lane closure prohibitions will be in effect from that date onward.

### *18.3.2 Haul Roads*

The Design-Builder must have its haul roads pre-approved by the appropriate governing agency. The Design-Builder shall be responsible for maintenance of haul roads during construction and restoration of haul roads to levels specified by the appropriate governing agency.

### *18.3.3 Pedestrian Access and Trails*

The Design-Builder shall maintain pedestrian access on all sidewalks, trails, and intersections along all streets as much as possible. If access cannot be maintained, the Design-Builder shall obtain Approval from the Department and the appropriate governing agency to close or modify the pedestrian access and shall furnish and install proper signing for pedestrians.

The Department and other appropriate governing agencies shall be notified 10 Working Days prior to the closure, and advanced signing shall be provided notifying all users of the closure. This signing shall be erected a minimum of five (5) working days prior to the closure and shall note the closure duration.

### *18.3.4 Temporary Mainline Crossovers*

Temporary mainline crossovers shall be designed and constructed for single lane in each direction, in accordance with the following criteria:

- Minimum design speed: 45 mph
- Minimum width of paved driving surface: 18 feet
- Minimum width of aggregate shoulder on each side of the traveled way: 3 feet
- Design curves: 4 degrees
- Infield slope: no steeper than 1:4 (v:h)
- Temporary crossovers must be located outside the area of an entrance or exit ramp that is open to traffic by a minimum of:
    - 800 feet from the end of the taper on an entrance ramp
    - 400 feet from the end of the taper on an exit ramp

### *18.3.5 Temporary Auxiliary Lanes and Exit Ramp Extensions*

Temporary lanes and extensions for exit ramps shall be designed and constructed to meet the following requirements:

- Exiting traffic must not have to slow down in the through lanes to less than 50 mph in order to safely gain access to the temporary auxiliary lane.
- The temporary auxiliary lane must be long enough so that traffic leaving the through lane at 50 mph can slow down safely to a speed of 30 mph.
- The temporary auxiliary lane shall have a paved surface width of at least 12 feet and an aggregate shoulder width of at least 3 feet.
- Temporary bypass extensions shall have a paved surface width of at least 16 feet and an aggregate shoulder width of at least 3 feet on both sides.
- The infield slope shall not be steeper than 1:4 (v:h).
- Acceleration lanes shall be designed to meet the standards shown in the *Highway Design Manual*.
- All temporary auxiliary lanes and extensions for exit ramps shall be provided with temporary overhead lighting.
- A minimum 2-foot reaction distance shall be provided for any temporary or permanent barrier device, including portable temporary concrete barrier.
- The Design-Builder shall install the final signing and pavement markings required to safely open the road to traffic. This Work shall be completed on or before the date of opening.

### *18.3.6 Temporary Guardrail, Barrier, Attenuators, and Glare Screen*

The Design-Builder shall be responsible for using temporary guardrail or barrier and attenuators to protect the traveling public from the following:

- Fixed objects within the clear zone
- Drop-offs that are not in accordance with the traffic control treatment of longitudinal joint and edge drop-off guidelines in the Department Field Manual for Temporary Traffic Control Zone Layout

- Slopes steeper than 1:4 (v:h)

## 18.4 Construction Requirements

The Design-Builder shall be responsible for all Project Maintenance of Traffic starting at 12:01 a.m. on the Day work begins on the Project. All traffic control devices must be continually and adequately monitored and maintained to ensure proper placement and the safe and efficient flow of all construction traffic into and out of the Project. Such responsibility and maintenance shall continue until 11:59 p.m. on the Day of Substantial Completion of the Project and when such traffic control devices are no longer required as determined by the Department. The Department may, in writing, temporarily suspend such responsibility in conjunction with an official suspension for weather or other reasons.

### *18.4.1 Construction Area Traffic Control Devices*

Flagging, signs, and temporary traffic control devices furnished, installed, maintained, and removed when no longer required shall conform to the provisions in Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications and these Technical Provisions.

Category 1 temporary traffic control devices are defined as small and lightweight (less than 100 pounds) devices. These devices shall be certified as crashworthy by crash testing, crash testing of similar devices, or years of demonstrable safe performance. Category 1 temporary traffic control devices include traffic cones, plastic drums, portable delineators, and channelizers.

If requested by the Department, the Design-Builder shall provide written self-certification for crashworthiness of Category 1 temporary traffic control devices at least 5 working days before beginning any work using the devices or within 2 working 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 Department 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 Lane Closure Charts specified in Exhibit 18-A.

Work that interferes with public traffic shall be limited to the hours when lane closures are allowed, except for work required under Sections 7-1.08, "Public Convenience," and Section 7-1.09, "Public Safety," of the Standard Specifications.

Designated legal holidays are: January 1st, the third Monday in February, the last Monday in May, July 4th, the first Monday in September, November 11th, Thanksgiving Day, and December 25th. When a designated legal holiday falls on a Sunday, the following Monday shall be a designated legal holiday. When November 11th falls on a Saturday, the preceding Friday shall be a designated legal holiday.

Special days are: the third Monday in January.

The maximum length of a single stationary lane closure shall be 1/3 mile.

Not more than one (1) separate stationary lane closures will be allowed in each direction of travel at one time.

Local authorities shall be notified at least five (5) business days before work begins. The Design-Builder shall cooperate with local authorities to handle traffic through the work area and shall make arrangements to keep the work area clear of parked vehicles.

Adjacent ramps, in the same direction of travel, servicing two (2) consecutive local streets shall not be closed simultaneously unless directed by the Department.

SC6-3(CA) (RAMP CLOSED) sign shall be used to inform motorists of the temporary closing of a connector, entrance ramp or exit ramp for 1 business day.

SC6-4(CA) (RAMP CLOSED) sign shall be used to inform motorists of the temporary closing of a connector, entrance ramp or exit ramp for more than 1 business day.

The SC6-3(CA) or SC6-4(CA) signs shall be installed at least 7 days before closing the connector or ramp, but not more than 15 days before the connector or ramp closure. The Design-Builder shall notify the Department at least 2 business days before installing the SC6-3(CA) or SC6-4(CA) signs.

Accurate information shall be maintained on the SC6-3(CA) or SC6-4(CA) signs. The SC6-3(CA) or SC6-4(CA) signs, when no longer required, shall be immediately covered or removed.

Personal vehicles of the Design-Builder's employees shall not be parked on the traveled way or shoulders including sections closed to public traffic.

When work vehicles or equipment are parked within 6 feet of a traffic lane to perform active construction, the shoulder area shall be closed with fluorescent orange traffic cones or portable delineators placed on a taper in advance of the parked vehicles or equipment and along the edge of the pavement at 25-foot intervals to a point not less than 25 feet past the last vehicle or piece of equipment. A minimum of 9 traffic cones or portable delineators shall be used for the taper. A W20-1 (ROAD WORK AHEAD) or W21-5b (RIGHT/LEFT SHOULDER CLOSED AHEAD) or C24(CA) (SHOULDER WORK AHEAD) sign shall be mounted on a crashworthy portable sign support with flags. The sign shall be placed where designated by the Department. The sign shall be a minimum of 48" x 48" in size. The Design-Builder shall immediately restore to the original position and location a traffic cone or delineator that is displaced or overturned, during the progress of work.

If minor deviations from the lane requirement charts are required, a written request shall be submitted to the Department at least 15 calendar days before the proposed date of the closure. The Department may approve the deviations at its sole discretion if the work can be expedited and better serve the public traffic.

**Lane Closure Restriction for Designated Legal Holidays and Special Days**

| Thu | Fri | Sat | Sun | Mon | Tues | Wed | Thu | Fri | Sat | Sun |
|---|---|---|---|---|---|---|---|---|---|---|
| x | **H** xx | xx | xx | | | | | | | |
| | **SD** xx | | | | | | | | | |
| x | xx | **H** xx | xx | | | | | | | |
| | | **SD** xx | | | | | | | | |
| | x | xx | **H** xx | xx | | | | | | |
| | | | **SD** xx | | | | | | | |
| | x | xx | xx | **H** xx | xxx | | | | | |
| | x | xx | xx | **SD** xx | xxx | | | | | |
| | | | | x | **H** xx | | | | | |
| | | | | x | **SD** xx | | | | | |
| | | | | | x | **H** xx | | | | |
| | | | | | | **SD** xx | | | | |
| | | | | | | x | **H** xx | xx | xx | xx |
| | | | | | | | **SD** xx | | | |

Legends:

| | |
|---|---|
| | Refer to lane closure charts |
| x | The full width of the traveled way shall be open for use by public traffic after 5:00 AM. |
| 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 10:00 PM. |
| **H** | Designated Legal Holiday |
| **SD** | Special Day |

## *18.4.3 Closure Requirements and Conditions*

Closures shall conform to the provisions in "Design Requirement," "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 calendar days and not more than 125 calendar days before the anticipated start of any operation that will:

1. Reduce horizontal clearances, traveled way, including shoulders, to two lanes or less due to such operations as temporary barrier placement and paving

2. Reduce the vertical clearances available to the public due to such operations as pavement overlay, overhead sign installation, or falsework or girder erection

The Closure Schedule shall show the locations and times of the proposed closures. The Closure Schedule request forms furnished by the Department shall be used. Closure Schedules submitted to the Department with incomplete or inaccurate information will be rejected and returned for correction and resubmittal. The Design-Builder will be notified of disapproved closures or closures that require coordination with other parties as a condition of approval.

Closure Schedule amendments, including adding additional closures, shall be submitted by noon to the Department, in writing, at least 5 working 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 working 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 working 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 | | 1st half hour<br>2nd half hour<br>2nd hour and beyond | $2,000 / 10 minutes<br>$4,000 / 10 minutes<br>$6,000 / 10 minutes |
| Connector | | 1st half hour<br>2nd half hour<br>2nd hour and beyond | $1,000 / 10 minutes<br>$2,000 / 10 minutes<br>$4,000 / 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 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. Department will respond to the submittal within 5 Working Days.

### *18.5.2 Released For Construction Documents (RFC)*

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

- Stage Construction Plans
- Traffic Handling Plans
- Detour Plans
- Specifications and Special Provisions

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

### *18.5.3 Reports/Project Documentation*

The Design-Builder shall provide the Department with all correspondences and meeting minutes regarding MOT issues.

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

### *18.5.4 As-Built Plans*

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

# EXHIBIT 18-A

Lane Closure Charts

This document is provided as an electronic file.

# 19 MAINTENANCE DURING CONSTRUCTION

## 19.1 General

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

## 19.2 Administrative Requirements

### *19.2.1 Standards*

The Design-Builder shall perform the maintenance during construction work in accordance with the latest editions of manuals and documents listed in Book 3. In the event of a conflict among the standards set forth in Book 3, the order of precedence shall be as set forth below, unless noted otherwise:

| **Agency** | **Title** |
|---|---|
| Department | *Maintenance Manual Volumes I and II* |
| Department | *Construction Manual* |
| Department | Standard Special Provisions |
| Department | Standard Plans |
| Department | *Standard Specifications* |
| Department | *Highway Design Manual* (HDM) |
| AASHTO | *Roadside Design Guide* |
| AASHTO | *Policy on Geometric Design of Highway and Streets* |
| Department | *Project Development Procedure Manual* |

### *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 person in charge of maintenance efforts.

The Maintenance Management Plan shall include the results of a pre-construction video of the existing conditions within the Project limits, and shall include haul routes and detour routes used by the Design-Builder. The Maintenance Management Plan shall also provide for a post-construction video to be performed as a part of Project Acceptance procedures. The Design-Builder shall not commence construction until the Maintenance Management Plan is accepted.

The Maintenance Management Plan shall be updated at least annually to reflect any changes in the Design-Builder's construction activities. If the staging or phasing of the construction and methods of the Design-Builder change drastically and/or new elements are encountered not previously addressed in the Maintenance Management Plan, the Design-Builder shall update the Maintenance Management Plan prior to commencing with the new Work.

### *19.2.3 Meetings*

The Design-Builder's supervisor responsible for maintenance during construction shall attend weekly field meetings and report to the Port the previous weeks maintenance activities and upcoming activities they are tracking or planning for.

## 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, including highway, local roads, bridges, landscaping and appurtenant facilities, 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 day Final Acceptance is granted. 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 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. The Design-Builder shall be responsible for maintaining the following facilities:

- Temporary facilities constructed by the Design-Builder as part of the Project.
- Existing facilities that are to be later replaced or reconstructed as part of the Contract Work.
- Existing facilities that are to remain.
- Permanent facilities constructed as part of the Contract Work.
- Haul routes for Project materials.
- Project detours initiated by the Design-Builder.

Maintenance on temporary or existing facilities to be replaced shall be performed by the Design-Builder 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 to maintain the above noted facilities include the following:

- Repair of shoulder drop-offs.
- Replacement/repair of existing asphalt shoulders used for temporary traffic control or hauling.
- Replacement/repair of temporary roadways and crossovers.
- Replacement/repair of guardrail, barriers, and traffic attenuators.
- Maintenance of temporary delineators, temporary signing, and temporary pavement marking.
- Maintenance/repair of overhead signs, including structures and associated electrical systems.
- Drainage/erosion control maintenance related to construction activities.
- Repair of approach slabs damaged by construction operations.
- Repair of pavement damaged by construction operations.
- Maintenance of haul routes.
- Temporary lighting and signal system maintenance.
- Fence maintenance including Right of Way fencing and temporary fencing.
- Vegetation control, including mowing, and weed control. If construction activities come in contact with any undesirable species, as defined by the Contract Documents, within the Project limits, the Design-Builder shall permanently remove or otherwise address the issue.
- Litter control. Litter/debris within the Project limits shall be removed within 48 hours.

- Sweeping and picking-up debris and materials that fall outside the Project limits when entering or exiting the Project site.
- Graffiti removal. Offensive graffiti within the Project limits shall be removed within 48 hours.
- Maintenance of storm sewer system related to construction activities.
- Maintenance of existing landscape and irrigation systems.
- Replacement/repair of temporary and permanent barrier wall.
- Maintenance of sidewalks, and driveways..

The Design-Builder shall prepare and submit to the Department a Monthly Maintenance Report detailing all maintenance activities performed. The Design-Builder shall subdivide the reported activities as detailed in Section 19.4.1.

## 19.5 Deliverables

Unless otherwise indicated, all deliverables shall be submitted in both electronic format and hardcopy format. Acceptable electronic formats include Microsoft Word, Microsoft Excel, or Adobe Acrobat (.PDF) files, unless otherwise indicated. At a minimum, the Design-Builder shall submit the following to the Department:

| Deliverable | For Acceptance or Approval | Number of Copies | | Submittal Schedule | Reference Section |
|---|---|---|---|---|---|
| | | Hardcopy | Electronic | | |
| Maintenance Management Plan | Acceptance | | 1 (.PDF) | Within 60 Days of NTP1 | 19.2.2 |
| Maintenance Management Plan update | Acceptance | | 1 (.PDF) | At least Annually, on the date of the original Maintenance Management Plan submittal or as specified in the section reference. | 19.2.2 |
| Monthly Maintenance Reports | Acceptance | | 1 (.PDF) | Within the first 5 Days of each month | 19.4.1 |

# 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's commitment to integrate bicycle and pedestrian travel into Project Development. Damaged Bicycle and Pedestrian facilities within the Planned Right of Way limits shall be restored to current standards as of the Instructions to Proposers (ITP) 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 Request For Proposals (RFP) issue Date unless specified herein or 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 Highway and Streets |
| 4 | Department | Special Provisions and Non-Standards Special Provisions |
| 5 | Department | Standard Plans |
| 6 | Department | Design-Build Modifications to the Standard Specifications |
| 7 | Department | Standard Specifications |
| 8 | AASHTO | Roadside Design Guide |
| 9 | Department | Technical Memoranda and preliminary engineering documents |

| | | |
|---|---|---|
| 10 | California | Code Regulations Title 24 |
| 11 | USDOT | Record of Decision (ROD) |

#### 20.2.1.2 Pedestrian 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 Highway and Streets |
| 4 | Department | Standard Special Provisions and Non-Standards Special Provisions |
| 5 | Department | Standard Plans |
| 6 | Department | Design-Build Modifications to the Standard Specifications |
| 7 | Department | Standard Specifications |
| 8 | AASHTO | Roadside Design Guide |
| 9 | Department | Technical Memoranda and preliminary engineering documents |
| 10 | California | Code Regulations Title 24 |
| 11 | USDOT | Record of Decision (ROD) |

### *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; |
| FHWA | Research Study and Guidelines for Sidewalks and Walkways<br>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 |
| Department | Traffic Manual |
| AASHTO | Roadway Lighting Design Guide |

### *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 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 shall at its own discretion use any software when designing plans for approval but shall prepare final drawings in MicroStation V8 or the latest version available upon agreement from the engineer.

### *20.2.5 Meetings*

The Department, the City of Baldwin Park and the Design-Builder shall meet at the request of one of the parties, 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 Department will assist in the coordination and resolution of all bicycle and pedestrian issues with affected interests and regulatory agencies and to ensure consistency with the existing and planned bicycle and pedestrian facilities. 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.

### *20.2.7 Certification Requirements*

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

## 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.

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 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 ITP 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.

### *20.3.3 Pedestrian Facilities*

Design-Builder's pedestrian facilities shall be consistent with the region's pedestrian 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 ITP 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.

#### 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.

### *20.3.4 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 the City of Baldwin Park requirements section in these Technical Provisions for the design of bicycle and pedestrian facilities for local streets having jurisdiction over such facilities.

## 20.4 Construction Requirements

The Design-Builder is required to coordinate any closure, modification and detour of existing bike paths and pedestrian routes with the local agencies, communities, businesses, schools and emergency services.

## 20.5 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.

### *20.5.1 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.

### *20.5.2 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 begin. Approval for Bicycle and Pedestrian Facilities RFC Documents plans is required.

### *20.5.3 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
- Reports/Project documentation
- Specifications and Special Provisions

### *20.5.4 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. 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.

### *20.5.5 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

### *20.5.6 Bicycle and Pedestrian Concept Plan*

The Bicycle and Pedestrian Concept Plan (permanent or temporary) with incorporated comments received at the Bicycle and Pedestrian Concept Meeting shall be submitted 60 days after the concept meeting.

### *24.5.7 Non- Standard Specifications and 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.

### *20.5.8 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 requirements of Final Design Documents.

# 21 ROADWAY PAVEMENTS

## 21.1 General

The Design-Builder shall perform all Work necessary to meet the requirements to design and construct roadway 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 and references, warranties, design and construction criteria, maintenance during construction, and required submittals.

The Design-Builder shall coordinate with all 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

### *21.2.1 Standards*

Perform the roadway 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 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 |
| 2 | Department | Highway Design Manual |
| 7 | Department | Standard Plans |
| 8 | Department | Design-Build Modifications to the Standard Specifications for Construction |
| 9 | Department | Standard Specifications |
| 10 | Department | Technical Memoranda and preliminary engineering documents |
| 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 construction analysis and design.

**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 |
| Department | Project Development Procedure Manual |

### *21.2.3 Engineering Documents*

Exhibit 21-A shows the proposed pavement design for the Project. The Design-Builder shall use the typical structural section [1] on the mainline, connector, and shoulders. Verify all information prior to use. Any information, such as traffic projections, equivalent single axle load projections, or changes to pavement standards and policies that would require modifying the proposed pavement design shall be brought to the attention of the Department for resolution prior to initiating work.

The Design-Builder shall not make Project changes that alter the essential functions and characteristics of the Project, such as safety, pavement design life, traffic operations, durability, desired appearance, maintainability, environmental protection, drainage, and other permitted constraints without obtaining the prior approval of the Department including any necessary design exception or exemptions. 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. .

### *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 listed in the following Caltrans website:

www.dot.ca.gov/hq/esc/Translab/OPD/DivisionofDesign-software.htm

The Design-Builder shall at its own discretion use any software when designing plans for approval but shall prepare the final drawings using MicroStation V8 as the drafting software with conversion to PDF available. All reports and documents shall be prepared in Microsoft Excel or Word format.

### *21.2.5 Equipment Requirements*

The Design-Builder shall use profilograph and falling weight deflectometers for field measurements of pavement. The equipment shall meet the requirements of California Test Method CT 526 and 356 respectively and shall be calibrated in relation to Caltrans equipment

### *21.2.6 Personnel Requirements*

The Design-Builder shall provide a Pavement Engineer who performs pavement calculations, develops pavement structure recommendations, details, or plans. The Pavement Engineer shall be licensed in the State of California and shall have a minimum of five (5) years experience in structural pavement design.

### *21.2.7 Certification Requirements*

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

### *21.2.8 Meetings*

The Department, the City of Baldwin Park, 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 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.

### *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 roadway pavement structure recommendations on the Project to the Department.

The Design-Builder shall use the outcome of the meeting to finalize the roadway pavement needs of the Project.

### *21.3.2 Roadway Pavement Analysis and Design*

The Design-Builder shall design, construct, and where applicable, maintain roadway pavements using the Best Industry Practices. 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 recommended designs and that meets the following performance requirements:

- Provide a pavement Design-Life per Chapter 610 of the Highway Design Manual
- Provide a durable, maintainable pavement system that meets or exceeds pavement design life criteria with the specified structural capacity; skid resistance, and superior ride quality
- Include pavement-to-structure transition areas as a part of ride quality
- Minimize pavement-to-structure transition deviations
- Minimize pavement type-to- pavement type transition deviation

- Minimize rutting, and maximize maintainability at intersections
- Provide bridge pavement approach slabs per Chapter 670 of the *Highway Design Manual* and associated publications.
- Provide free-draining pavement sections both above and beneath the pavement surface for pavement constructed on this Project. Do not exacerbate 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 the recommended designs such as temporary construction areas

### *21.3.3 Pavement on Local Roads*

The Design-Builder shall use the typical structural section [2] (Exhibit 21-A) on local streets and frontage roads Subsurface drainage outlets shall not cross roadways. Left and right side subsurface drainage systems shall not use a common outlet pipe.

### *21.3.4 Special Roadway Pavement Designs*

Special roadway pavement designs shall be fully justified and submitted for approval.

Special roadway pavement designs are defined as those that meet either or both of the following criteria:

- Involve products, methods, or strategies that either reduces the structural thickness to less than what is determined by the standards set forth in this provision.
- Utilize experimental products or procedures not covered in the engineering tables or methods found in the standards set forth in this provision.

The Design-Builder shall submit to Caltrans 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.

### *21.3.5 Repairs of existing roadway*

The Design-Builder shall repair grind adjacent concrete lanes prior to widening in accordance with Caltrans Standard Special Provisions. The Design-Builder shall repair any failed concrete slabs and defects in adjacent asphalt pavement in conjunction with widening.

### *21.3.6 Materials Report*

For any modifications to the design for locations not covered in the recommended designs, the Design-Builder shall prepare a Materials Report and submit for approval. The Design-Builder shall prepare the Materials Report in accordance to Topic 114 of the Caltrans Highway Design Manual.

### *21.3.7 Supplemental Pavement Requirements*

The Design Builder shall refer to the Project Report or Final Environmental Document for pertinent information regarding Roadway Pavement.

#### *21.3.7.1 Pavement Compaction*

Roadway Pavement Compaction shall be in accordance to *Caltrans Standard Special Provisions and Standard Specification*s.

#### *21.3.7.2 Profile Index*

The pavement surface shall be profiled, in accordance to *Caltrans Standard Special Provisions and Standard Specification*s.

##### *21.3.7.3 Quieter Pavement*

The Design-Builder shall utilize approved quieter pavement surface treatments where required as stipulated in Pavement Policy Bulletin 9-02 *Quieter Pavement Strategies for Noise Sensitive Areas.*

##### *21.3.7.4 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. The Department shall use the CQO certified results to determine Substantial Completion of pavement work. A verification of the ride quality may be conducted.

The Department will evaluate skid resistance. Existing skid resistance on pavement that remains in place shall not be reduced. Pavements placed by the Design-Builder shall provide a skid resistance value greater than 50.

### *21.4.7 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.

### *21.4.8 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 City of Baldwin Park. 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 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
- Life Cycle Cost Analysis of various alternatives considered using the Life Cycle Cost Analysis for Pavements Form.
- 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 Caltrans Project Manager.

#### 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 Caltrans 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, 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

Structural Material Recommendation

This exhibit 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, structural pollution control devices, retention/detention facilities (ponds), conveyances, erosion control, protection of downstream water bodies, sampling, permit compliance, and overall water quality protection in accordance with all applicable state and federal regulations.

## 22.2 Administrative Requirements

### *22.2.1 Standards*

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

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

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

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

**Stormwater Standards**

| Priority | Agency | Title |
|---|---|---|
| 1. | Caltrans | Standard Special Provisions |
| 2. | Caltrans | Standard Specifications |
| 3. | Caltrans | Standard Plans |
| 4. | Caltrans | Highway Design Manual |
| 5. | Caltrans | Project Planning and Design Guide (PPDG) |
| 6. | Caltrans | Caltrans Treatment BMP Design Guidance Documents |
| 7. | Caltrans | Stormwater Pollution Prevention Plan (SWPPP) and Water Pollution Control Program (WPCP) Preparation Manual |
| 8. | Caltrans | Construction Site Best Management Practices (BMPs) Manual |
| 9. | Caltrans | Construction Site Stormwater Quality Sampling Manual |
| 10. | USDA | Revised Universal Soil Loss Equation, Version 2 (RUSLE II) |
| 11. | Caltrans | Construction Manual |

#### *22.2.1.1 Permits*

1. Caltrans NPDES Permit 99-06-DWQ
2. Caltrans Stormwater Management Plan
3. NPDES General Permit For Storm Water Discharges Associated with Construction 2009-0009-DWQ (CGP 2009-0009-DWQ effective July 1, 2010)
4. Project Specific 404 Permit related to stormwater (if applicable)
5. Project Specific 401 Certification requirements related to stormwater (if applicable)

7. Project Specific Fish and Game 1601 requirements related to stormwater (if applicable)

### *22.2.2 References*

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

**Stormwater Publications References**

| Agency | Title |
|---|---|
| AASHTO | Roadside Design Guide |
| AASHTO | Model Drainage Manual |
| Caltrans | Ready-To-List and Construction Contract Award Guide (RTL Guide) |
| Caltrans | Fish Passage Design for Road Crossings |
| FHWA | Hydraulic Engineering Circulars (as listed in Caltrans Highway Design Manual) |
| FHWA | Hydraulic Design Series (as listed in Caltrans Highway Design Manual) |
| CASQA | California Stormwater Quality Association (CASQA) Construction BMP Handbook |

### *22.2.3 Preliminary Engineering Plans*

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

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

Best Management Practice design shall follow the *Caltrans Project Planning and Design Guide* and design guidance documents. The Design-Builder may use the plans and specifications developed by Department or they may choose to develop a special design to fit the project needs with coordination and approval of Department's Headquarters Office of Storm Water Management - Design. The intent is to provide some flexibility in the size or shape of the existing approved BMPs, but not to use proprietary devices that have not been tested for effectiveness by Department. Proprietary devices may only be used with prior approval of Headquarters Office of Storm Water Management – Design and with appropriate testing information to assure that they are feasible long-term for a Department facility. The stormwater design shall include a feasibility analysis of BMPs to document that the NPDES permit threshold for compliance of Maximum Extent Practicable (MEP) has been met.

All approved treatment BMPs have guidance, plans sheets, and specifications developed by Department. This information is available on the Department's Storm Water webpage *(http://www.dot.ca.gov/hq/oppd/stormwtr/index.htm ).*

### *22.2.4 Software*

The Design-Builder shall prepare drawings in MicroStation and provide a copy in Adobe Acrobat to share with other agencies that do not have MicroStation. The Storm Water Data Report (SWDR) shall be submitted in Microsoft Word, Microsoft Excel, and Adobe Acrobat formats.

### *22.2.5 Stormwater Data Collection*

The Design-Builder shall follow the PPDG in the preparation of the SWDR. The PID and PA/ED level SWDR information (see Exhibit 22-A) shall be used by Design-Builder to develop the PS&E level

equivalent SWDR. The SWDR will utilize information from the environmental document, drainage report, geotechnical report or other project information pertinent to the overall stormwater design and as described in the PPDG, and described in Section 12 to determine the stormwater design. The calculations for drainage design and stormwater should be consistent in methodologies for hydrology and hydraulics, though there may be some additional storm frequencies and durations needed for design of BMPs. If alternative methods are used to determine flows due to permit requirements, then the assumptions shall be clearly noted. To establish a stormwater drainage system that complies with the requirements and accommodates the historical hydrologic flows, the Design-Builder must calculate the pre and post hydrology for all sub watersheds within the project site.

### *22.2.6 Coordination with Other Agencies and Disciplines*

The Design-Builder shall coordinate all Storm 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 Caltrans standards, plans, specifications, guidance, and permits. Local standards for stormwater design do not always meet Department threshold for feasibility or may not be appropriate for the highway environment due to many competing standards 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, and federal provisions. Those qualifications include but are not limited to the following:

- California Registered Civil Engineer in accordance with the California Engineering Act for all engineering calculations.
- Registered Civil Engineer Stamp on final SWDR
- A qualified SWPPP Developer in accordance with Section VII of the CGP 2009-0009-DWQ.
- A qualified SWPPP Practitioner in accordance with Section VII of the CGP 2009-0009-DWQ.

## 22.3 Design Requirements

The Design-Builder shall develop a final SWDR. The Design-builder shall follow the requirements contained in the PPDG and permits to develop a final SWDR.

The Design-Builder shall provide stormwater treatment to a minimum of 76 percent of Water Quality Volume (WQV). This WQV represents the runoff from a 0.75-inch rain event falling on all impervious surfaces within the Project limits.

### *22.3.1 Surface Hydrology*

#### 22.3.1.1 Design Frequencies

The Design-Builder shall meet the requirements of the PPDG and Section 12 for the design frequencies for BMP elements.

#### 22.3.1.2 Hydrologic Methods

The methods for sizing BMPs should use 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 shall include the post construction BMPs as they will help reduce the water quality impacts of changes in flows, volume, and chemistry.

### *22.3.2 Permanent Stormwater Treatment System*

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

### *22.3.3 BMP Structures*

Best Management Practice design shall follow the Caltrans Project Planning and Design Guide and design guidance documents. The Design-Builder may use the Caltrans Treatment BMP Design Guidance Documents or they may choose to develop a special design to fit the Project needs with coordination and approval of the Department. 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.

For all treatment BMP structures the Design-Builder chooses to modify, a special design and structural analysis shall be provided for Department Approval. 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 regulation when applicable.

#### 22.3.3.1 Conveyances

Many stormwater conveyances also function as design pollution prevention BMPs and shall be designed to meet the 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 used in the Project design.

#### 22.3.3.2 Stormwater Treatment Overview Map

The Design-Builder shall submit a Project Stormwater Treatment Overview Map to the Department for Acceptance prior to initiating detailed design, and shall submit a copy of the Project Stormwater Treatment Overview Map in MicroStation format. This map may be combined with the Project Drainage Overview Map required in Section 12. The map shall show sub-watershed areas, flows, and volumes used to design and size BMPs. The map will show locations and types of BMPs that are proposed for the Project.

#### 22.3.3.3 Bio-Swales and Roadside Open Channels

The Design-Builder may use bio-swales, which are an open channel, if they meet the design criteria for shear stress provided in Section 12 of this document, Caltrans *Highway Design Manual*, and HEC 15. Bio-swales are an Approved treatment BMP, but care must be taken in the design to provide a stable facility beyond the life of temporary BMPs so that a long term erosion problem does not occur.

#### 22.3.3.4 Temporary and Permanent Erosion Control Plans

The Design-Builder shall develop plans showing the locations of all structural stormwater treatment BMPs including bio-filtration strips and swales.

- Temporary BMPs shall be included in the plans using the Caltrans Standard Plans and Construction Site BMP Manual. If there are non-standard BMPs or non-standard applications of temporary BMPs, they shall be identified in the specifications or in the construction details.

- All permanent BMPs shall be shown on the plans. The Design-Builder shall label alignments, stationing, walls, bridges, paths/walks, lakes, rivers, environmentally sensitive areas, R/W and easements, existing drainage structures and pipes, proposed drainage structures and pipes, surface flow arrows, riprap locations, check dams, silt fences, rolled erosion control products, seeding, mulch areas, and other erosion control items. Plans shall also include high and low point stations and elevations, 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.

#### 22.3.3.5 Project-Specific Specifications and Special Provisions

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

The Department 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.

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 or when proposing the use of a nonstandard special provision no already listed in the Contract Documents.
- 120 days for use of experimental or nonstandard design procedures that are not supported by the Caltrans Standards.

## 22.4 Construction Requirements

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

## 22.5 Deliverables

Unless otherwise indicated, all deliverables shall be submitted in both electronic format and hardcopy format. Acceptable electronic formats include Microstation Inroads, Microsoft Word, Microsoft Excel, or Adobe Acrobat (.PDF) files, unless otherwise indicated. At a minimum, the Design-Builder shall submit the following to the Department:

| Deliverable | For Acceptance or Approval | Number of Copies | | Submittal Schedule | Reference Section |
|---|---|---|---|---|---|
| | | Hardcopy | Electronic | | |
| Storm Water Data Report (SWDR) | Approval | 2 | X | Within 1 year of NTP2 | 22.3 |
| Storm Water Treatment Overview Map | Acceptance | 2 | X | Prior to NTP2 | 22.3.3.2 |
| Temporary and Permanent Erosion Control Plans | Acceptance | 5 | X | Prior to construction<br>10-Day review period required | 22.3.3.4 |
| Project-specific special provision and specifications (1) | Acceptance | 5 | X | Prior to construction<br>10-Day review period required | 22.3.3.5 |
| | | | | | |

Notes:

(1) – Required only if Design-Builder is proposing methods or materials not covered by standards.

# EXHIBIT 22-A

Stormwater Data Report

This exhibit is provided as an electronic file

# 23 CONNECTOR METERING

## 23.1 General

The Design-Builder shall conduct all Work necessary to meet the requirements for connector metering for the Project.

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

The Design-Builder shall coordinate with all 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.

## 23.2 Administrative Requirements

### *23.2.1 Standards*

The Design-Builder shall design and construct the Connector Metering and Traffic Monitoring Stations (TMS) 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 specified herein or modified by Addendum or Change Order.

**Connector Metering and TMS Standards and Requirements**

| Priority | Agency | Title |
|---|---|---|
| 1 | Department | January 2000 Ramp Meter Design Manual |
| 2 | Department | Traffic Manual |
| 3 | Department | April 2007 Signal, Lighting, and Electrical System Design Guide |
| 4 | Department | California Manual on Uniform Traffic Control Devices (CA MUTCD) |
| 5 | NFPA | National Electrical Code 2005 |
| 6 | Department | Signal Design Detail Sheets |
| 7 | Department | Standard Special Provisions |
| 8 | Department | Standard Plans |
| 9 | Department | Design-Build Modifications to the Standard Specifications for Construction |
| 10 | Department | Standard Specifications |
| 11 | Various | Technical Memoranda |

| | | |
|---|---|---|
| 12 | Department | CADD Users Manual |
| 13 | Department | Plans Preparation Manual |
| 14 | 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 system.

**Connector ~~Ramp~~ Metering and TMS 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) |
| NFPA | National Fire Protection Association |

### *23.2.4 Preliminary Engineering Documents*

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

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

### *23.2.5 Software Requirements*

.The Design-Builder shall prepare drawings in MicroStation V8 as the drafting software, in addition to other software used by the Design-Builder to design the Connector Metering elements of the project.

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

### *23.2.6 Meetings*

The Department and the Design-Builder shall meet at the request of one of the party, as necessary, to discuss and resolve matters relating to the Connector Metering 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 within five (5) days of the meeting a record of the minutes to the meeting.

### *23.2.7 Coordination with Other Agencies and Disciplines*

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

### *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.

## 23.3 Design Requirements

Design, furnish, and install all components of a connecter metering systems 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.

### *23.3.1 Connector Metering Design*

#### 23.3.1.1 Connector Metering Design Concept Meeting

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

The Design-Builder shall use the outcome of the meeting to finalize the ramp metering system needs of the Project**.**

#### 23.3.1.2 Connector Metering Design Requirements

Connector Metering Work shall meet the requirements in the Department Ramp Meter Design Manual.

The Design-Builder shall design all temporary ramp-metering and TMS systems to comply with the same design and construction requirements of the permanent ramp metering and TMS systems.

The Design-Builder shall prepare all necessary engineering studies and applicable design reports to justify all the project connector metering and TMS 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.

#### 23.3.1.3 Specific Requirements

All ramp meter signals shall include all new traffic signal equipment, including conduit and pull boxes, Model 2070 controller assemblies in Model 334 cabinet, light emitting diode (LED) signal heads and poles, mast arms, and electrical service.

Ramp metering and TMS design shall include the following requirements:

- When cutting mainline loops, the loop wires for all lanes shall go directly to the pull box in the right shoulder.
- When the Detector Lead-in Cable (DLC) is longer than 1000 feet, DLC shall have two No. 12 stranded tinted copper shielded twisted pair conductors. Booster cabinet(s) shall be used where the loop detector is more than 2700 feet away from the Connector Metering.
- During construction, there shall be no disruption of service for the freeway TMS elements.

- During construction, Microwave vehicle detection sensors (MVDS) can also be used in lieu of the loop detectors and sensors as Vehicle Detection Stations.
- A Maintenance Vehicle Pullout (MVP) shall be installed adjacent to the connector metering and booster cabinet location.
- All loops which are not in the structure shall be type E and cut on the final layer of the roadway for verification purposes.
- All signal heads shall be 12 inches.
- No Detector Lead-in Cable splices shall be allowed.
- No communication (phone line) splices shall be allowed.
- Type 1 conduit shall be used unless otherwise specified.
- The minimum trade size of conduit from a electrical service cabinet to the adjacent pull box shall be two 3-inch
- For the Department lighting system only: Pull boxes to be installed in the structure shall be Type 9. The pull box lid shall be the wire theft-resistant type. The installation method of the pull boxes at locations other than in the structure shall follow the recommendation of the wire theft-resistant pull box lid manufacturer. Since this type of pull box lids are not the standard items for the Department, the Design Builder shall first obtain the necessary technical information, such as specification, shop drawing, and provision, etc., from the pull box lid manufacturer and submit to CALTRANS (the Department) for approval. See Section 23.5.7 for the Non-Standard Special Provision approval process. The wire theft-resistant pull box lids can be obtained at the following manufacturers,

  **Case Automation Corp**
  5920 Rickenbacker Ave
  Riverside, CA 92504
  951-637-6666
  951-202-7088
  Don Nielsen

  **Elite Machining Inc**
  2050 S Del Rio
  Ontario, Ca 92176
  951-271-0318
  Tyler Peterson

  **ERC, Inc**
  2970 E Maria St
  Rancho Dominguez, Ca 90221-5819
  310-603-2970
  Mike Coy

### 23.3.1.4 Electrical Requirements

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

#### 23.3.1.5 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 Station (TMS), Ramp Metering System (RMS), Connector Metering, 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 freeway 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.

The municipalities shall pay for power for lighting at the signalized intersections. Notify them at least seven calendar days before disconnecting the power. 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.

## 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 Department Approved Products List for Work Zones and ramp metering. The Design-Builder shall obtain the current Approved Products List.

Supply all other material and equipment required for the complete installation of the various ramp metering elements.

Each type of material or equipment to be installed by the Design-Builder shall be the same model and made by the same manufacturer.

### 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 s will receive a response within 15 days.

### *23.4.2 Connector Metering and Traffic Monitoring Stations*

The Design-Builder shall provide maintenance for permanent or temporary connector metering and Traffic Monitoring Station installations within the project limits until Final Acceptance of the Project.

All existing TMS elements within the project limit shall remain operational at all times throughout the construction period.

The Department Ramp Metering Branch shall operate all new or existing ramp metering. The Design-Builder shall coordinate with the Department Ramp Metering Branch all operation activities for permanent or temporary connector metering and TMS installations within the project limits until Final Acceptance of the Project.

### *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.

### *23.4.4 State Furnished Materials*

The following material and equipment will be furnished by the State (at no cost to the Design-Builder) and shall be installed by the Design-Builder:

- Model 2070 controllers
- Type 334 Controller Cabinet and Assemblies

The Design-Builder shall provide 90-calendar days written, advance notice of required State-furnished equipment prior to when equipment is required. Submit request to the Department. The Department will place the order with the manufacturer, receive the equipment at the lab, inspect the equipment, program/configure the equipment, approve it for installation, and provide it to the Design-Builder at no cost.

Notify the Department seven (7) calendar days in advance of the desired pick up date. Coordinate with the District Warehouse at least five (5) calendar days before actual pick up date of controllers and associated hardware.

Pick up equipment at:

California Department of Transportation

Maintenance Repair Lab

7310 E Bandini Boulevard

Commerce, California 90040

Telephone No: 213.620.2185

## 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 and TMS 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.

### *23.5.4 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

### *23.5.5 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 has 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 and TMS structures shall be submitted for Approval prior to fabrication.

### *23.5.6 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

### *23.5.7 Non- Standard Specifications and Non- Standard Special Provisions*

If the design methods or materials that are not part of Caltrans standards, the Design-Builder shall submit a request to Caltrans for approval prior to the field installation. The request shall include shop drawings,

comprehensive specifications, and provisions associated with the proposed non-standard methods or materials.

### *23.5.8 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 requirements of Final Design Documents.

# 24 PAVEMENT DELINEATION

## 24.1 General

The Design-Builder shall perform all Work necessary to meet the requirements for pavement delineation for the Project.

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

The Design-Builder shall coordinate with all 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.

## 24.2 Administrative Requirements

### *24.2.1 Standards*

The Design-Builder shall design and construct the pavement delineation 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 specified herein or modified by Addendum or Change Order

**Pavement Delineation Standards and Requirements**

| Priority | Agency | Title |
|---|---|---|
| 1 | CA MUTCD | California Manual on Uniform Traffic Control Devices |
| 2 | Department | Prequalified and Tested Signing and Delineation Materials |
| 3 | Department | Highway Design Manual (HDM) |
| 4 | Department | Standard Special Provisions |
| 5 | Department | Standard Plans |
| 6 | Department | Design-Build Modifications to the Standard Specifications for Construction |
| 7 | Department | Standard Specifications |
| 8 | Department | HOV Guidelines for Planning, Design and Operations |
| 9 | Various | Technical Memoranda |
| 10 | AASHTO | A Policy on Geometric Design of Highways and Streets |
| 11 | AASHTO | Roadside Design Guide |
| 12 | Department | Plans Preparation Manual |

### *24.2.2 References*

Use the references listed below as supplementary guidelines for the design and construction of the pavement delineation.

**Pavement Delineation References**

| **Agency** | **Title** |
|---|---|
| Department | New Policy and Directives (Pavement Delineation and Signing) |

### *24.2.3 Local Road System*

The Design-Builder shall design and construct all local pavement delineation elements in accordance with the applicable City of Baldwin Park standards, specifications and requirements within these technical provisions.

### *24.2.4 Preliminary Engineering Documents*

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

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

### *24.2.5 Software Requirements*

The Design-Builder shall at its own discretion use any software when designing plans for approval but shall prepare final drawings in MicroStation V8 or the latest version available upon agreement from the engineer.

### *24.2.6 Meetings*

Department, City of Baldwin Park, and the Design-Builder shall meet at the request of one of the parties, as necessary, to discuss and resolve matters relating to the Pavement Delineation 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 within five (5) days of the meeting a record of the minutes to the meeting.

### *24.2.7 Coordination with Other Agencies and Disciplines*

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

### *24.2.8 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.

## 24.3 Design Requirements

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

Provide for the orderly and predictable movement of all traffic.

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

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

## *24.3.1 Pavement Delineation*

Pavement delineation Work shall include designing, installing, modifying, or removing striping and pavement markings. All pavement delineation shall conform to the CA MUTCD, Caltrans Standard Plans and Standard Specifications, and to the requirements of City of Baldwin Park in these Technical Provisions. The Design-Builder shall prepare pavement delineation plans that show HOV striping, edge striping, lane line striping, arrows, legends, and pavement markings consistent with the needs of the project.

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

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

### 24.3.1.1 Pavement Delineation Concept Meeting

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

The Design-Builder shall use the outcome of the meeting to finalize the pavement delineation needs of the Project.

### 24.3.1.2 Pavement Delineation Plans

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

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

- Location of pavement arrows relative to adjacent crosswalk or limit line at freeway entrance ramps and exit ramp termini according to the CA MUTCD.
- Freeway entrance and exit ramps shall use Detail 9 for lanelines. Left edgelines for freeway-to-freeway connector shall use Detail 25A.

#### 24.3.1.3 Pavement Delineation Material Requirements

The Design-Builder shall provide permanent or temporary pavement delineation that meets Caltrans Standard Specifications and Caltrans Prequalified and Tested Signing and Delineation Materials list.

The permanent pavement markings shall be uniform in type, color, dimensions, location, and reflectivity as if in new condition.

All striping and pavement markings on the mainline and ramps shall be thermoplastic.

#### 24.3.1.4 Striping and Pavement Markings

All striping details shall conform to the CA MUTCD, Caltrans Standard Plans and Standard Specifications, Caltrans HOV Guidelines for Planning, Design, and Operations, and to the requirements of the City of Baldwin Park for the local roadway facilities.

Striping and pavement marking modifications that may be required on local streets shall conform to standards required by local jurisdictions. Refer to City of Baldwin Park requirements section in these Technical Provisions.

## 24.4 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 Approved Products List for Work Zones and Pavement Delineation, Signals and Lighting. The Design-Builder shall obtain from the Department the current Approved Products List.

Non-permanent striping details used during construction shall have the same features (e.g. pavement markers and striping) as the existing permanent striping details they replace.

### *24.4.1 Pavement Markings*

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

The various arrow pavement markings used for the freeway exit and entrance ramps, temporary or permanent, shall be 20 feet long and located per the CA MUTCD.

Diagonals and chevron pavement markings shall be 12 inches wide.

## 24.5 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.

### *24.5.1 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.

### *24.5.2 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 begin. Approval for Pavement Delineation RFC Documents plans is required.

### *24.5.3 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
- Reports/Project documentation
- Specifications and Special Provisions

### *24.5.4 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. 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.

### *24.5.5 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

### *24.5.6 Pavement Delineation Concept Plan*

The Pavement Delineation Concept Plan (permanent or temporary) with incorporated comments received at the Pavement Delineation Concept Meeting shall be submitted 60 days after the concept meeting.

### *24.5.7 Non- Standard Specifications and Non- Standard Special Provisions*

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

### *24.5.8 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 requirements of Final Design Documents.