

## **2.0 Project Management**

### **2.1 Administration**

The Contractor has the responsibility for management and performance of the Work. CDOT shall have the right to visit the Site and observe the Work to determine that the Work is proceeding in conformance with the requirements of the Contract Documents.

#### **2.1.1 Work Breakdown Structure (WBS)**

The Contractor shall submit to CDOT, along with its Preliminary Initial Schedule, a detailed Work Breakdown Structure (WBS) for Acceptance at least 10 days prior to NTP1. The Preliminary Initial Schedule shall include a detailed, organized hierarchical division of the WBS for completing each element of the Work. The Accepted WBS shall be the basis for organizing all Work under the Contract Documents, and shall be used as a basis for the Contract Schedules, and other cost control systems. The Contractor shall refer to and utilize Exhibit A of Book 2, Section 2, for preparation of the WBS.

The WBS shall at a minimum, conform to Book 2, Section 2 Exhibit A, which graphically depicts the WBS Activities for the Project. Exhibit A of Book 2, Section 2 shall be used for determination of segment limits and cost proposal preparation of WBS Activities further described herein and on Form J of the Instructions to Proposers (ITP).

All cost and schedule information shall roll up to Level IV through VII as identified in the Exhibit A. Further detail shall be provided by the Contractor for Level VI (e.g. Operator Interface System) to ensure a clear understanding of the Contract. The Contractor shall submit its Preliminary Initial Schedule broken down to the WBS Level VII. Additionally, a roll-up of Level VII Activities unique to design, construction, and maintenance shall be shown at Level VI.

The Accepted WBS shall be the basis for organizing all Work under the Contract, and shall be used to structure the Contract Schedules and other cost control systems. The Contractor shall submit its Original Initial Schedule specifying WBS Activities and proposed Work segments at least 15 days prior to NTP2. NTP2 shall not be issued until CDOT has Approved the Original Initial Schedule.

A methods statement shall be prepared for each of the Level V WBS Activities listed in the Original Initial Schedule for all critical path items, and for any Activity not listed that the Contractor considers a controlling factor for timely completion. The methods statement shall be completed in accordance with the Standard Specifications. The methods statements shall be submitted for review prior to NTP2.

**Table 2-1: WBS Levels**

<b>Level III:</b>	<b>DESIGN BUILD PROGRAM</b>
Program Level – CDOT use only: The summary of all program components	
<b>Level IV:</b>	<b>MAJOR PROGRAM ELEMENTS</b>
<u>Major Program Elements:</u>	
<ul style="list-style-type: none"> <li><input type="checkbox"/> Activities of the Contractor. This is the Contractor’s highest level.</li> </ul>	
<b>Level V:</b>	<b>CONTRACT COMPONENTS</b>
<u>Design Build Contract Components:</u>	
<ul style="list-style-type: none"> <li><input type="checkbox"/> Breakdown of all components as shown on Exhibit A, less Design Build Management items.</li> </ul>	
<b>Level VI:</b>	<b>CONTRACT SUBCOMPONENTS AND WORK ACTIVITIES</b>
<u>Breakdown defined by the Contractor:</u>	
<ul style="list-style-type: none"> <li><input type="checkbox"/> Lowest level of Price Proposal detail submitted on Form J for Design Build Management items.</li> <li><input type="checkbox"/> Basis for all progress payments</li> </ul>	
<u>Schedules</u> – The following CPM Schedules shall be cost loaded to this level:	
<ul style="list-style-type: none"> <li><input type="checkbox"/> Preliminary Initial Schedule</li> <li><input type="checkbox"/> Original Initial Schedule (or Revised Initial Schedule, if applicable)</li> <li><input type="checkbox"/> Current Initial Schedule</li> <li><input type="checkbox"/> Recovery Schedule</li> <li><input type="checkbox"/> As-Built Schedule</li> </ul>	
<b>Level VII:</b>	<b>WORK SUB-ACTIVITIES</b>
<u>Breakdown defined by the Contractor:</u>	
<ul style="list-style-type: none"> <li><input type="checkbox"/> The Contractor to define all Activities at this level, at a minimum the Contractor shall include Level VII items identified in Exhibit A.</li> </ul>	
<u>Schedules</u> - No specific Contract Schedules are required at this level. However, Level VII Activities are required as a component of the Monthly Progress Schedule.	

The payment to the Contractor will be in the amount shown on the Contractor’s Approved invoice less Retainage and any deductions.

## **2.1.2 Cost Management**

### **2.1.2.1 Progress Payment Calculations**

CDOT will base progress payments on a mutually agreed estimate of percent complete of the Work, not on measured quantities. The Contractor shall progress the Activities identified on the Approved Original Initial Schedule, the Current Initial Schedule, or the Approved Revised Initial Schedule (if applicable), for determining the Monthly Progress Schedule. The Accepted Monthly Progress Schedule will determine the amount of the Contractor’s progress payments. Percent complete shall be calculated using project scheduling

## **Book 2 Section 2: Project Management**

software meeting the requirements of this section, where progress is measured based on percent complete/days remaining.

Partial payment for stored Materials shall only be made as allowed in the Contract.

The Contractor's invoice shall not include a request for payment for Nonconforming Work documented by the Contractor's Quality Manager or CDOT.

### **2.1.2.2 Invoice Submittals**

The Contractor shall submit invoices to CDOT each month. Each monthly invoice shall be submitted in draft form for review within five Working Days following the prior month's end. Draft invoice submittals shall be done electronically in Microsoft Excel format.

### **2.1.2.3 Invoice Document Content**

The requirements for the supporting documents to be included with the invoice form shall be finalized by the Contractor in consultation with CDOT before NTP2. The Contractor may present variations in this format for CDOT Approval at least 15 days prior to the submittal of the first invoice. Once the Monthly Invoice format has been Approved by CDOT, the format shall not change unless subsequently Approved by CDOT.

The invoice documents shall include:

#### **1. Invoice Cover Sheet**

The Cover Sheet shall indicate the following information:

- A. Project number and title
- B. Invoice number (numbered consecutively starting with "1")
- C. Period covered by the invoice (specific calendar dates)
- D. Total earned to date for the Project as a whole and for each Level VI WBS Activity
- E. Nonconforming Work and amount withheld identified
- F. Authorized signature and title of signatory
- G. Date that invoice was signed

#### **2. Monthly Progress Report**

The Monthly Progress Report shall include the following:

- A. Brief narrative description of Level VI Activity and progress for the Project as a whole, including maintenance, design, and construction. Identify start date and completion dates
- B. Update of progress with respect to Utilities (if any)
- C. Identify whether any Completion and Interim Acceptance Deadlines are achieved or revised during the period
- D. Summary of QA/QC efforts, including result of design reviews
- E. Identify problems/issues that arose during the period and remaining issues to be resolved
- F. Summarize resolution of problems/issues raised in previous monthly progress reports or resolved during the period
- G. Summary of Project accidents (frequency and severity) and corrective actions taken
- H. Identify critical Schedule issues and proposed resolution
- I. Discuss Schedule variations from Completion Deadlines that have slipped or improved
- J. Monthly DBE/Workforce Development Plan Report and tracking
- K. Progress photographs
- L. Three month look-ahead schedule as further defined in Section 2.1

## **Book 2 Section 2: Project Management**

The format and detail level required for submittal of the Monthly Progress Report shall be established by CDOT, in consultation with the Contractor within 10 Working Days after NTP1. The Monthly Progress Report shall be on Contractor 8.5 x 11-inch letterhead and submitted for Acceptance by CDOT concurrent with the Monthly Invoice.

### 3. Updated Monthly Progress Schedule

No invoice shall be Approved nor payment made if there is not a current Accepted Monthly Progress Schedule and Current Initial Schedule in place. The status date of the Monthly Progress Schedule, coinciding with the payment invoice date, is the last day of each month. The data date for use in calculating the Monthly Progress Schedule shall be the first Working Day of the following month.

The Contractor shall make all corrections to the Monthly Progress Schedule requested by CDOT and resubmit the Monthly Progress Schedule. If the Contractor does not agree with CDOT's comments, the Contractor shall provide written notice of disagreement within five Working Days from the receipt of the comments. The items in disagreement shall be resolved in a meeting held for that purpose, if necessary.

### 4. Certification by Contractor's Quality Manager

The Contractor shall submit a certification signed by its Quality Assurance Manager accompanying each invoice request certifying that:

- A. All Contract Work, including that of designers, Subcontractors, Suppliers, and fabricators has been checked and/or inspected by the Contractor's Quality Program staff, and that all Work, except as specifically noted in the certification, conforms to the requirements of the Contract Documents.
- B. The Quality Management Plan (QMP), and all of the measures and procedures provided therein, are functioning properly and are being followed.
- C. All safety-critical Work, in conformance with the Project Safety Management Plan as further described in the Standard Specifications has been reviewed and sealed by the Professional Engineer of responsible charge before construction begins.

No invoice will be Approved (payment made) if there is not completion and implementation of the QMP.

### 5. Monthly Maintenance Progress Report

The Contractor shall submit to CDOT the current Monthly Maintenance Progress Report, as required in Book 2, Section 18.

No invoice will be reviewed or processed until all invoice documents and certifications, as identified in 2.1.2.3, are received by CDOT.

#### **2.1.2.4 Progress Status Meetings**

A Progress Status Meeting shall be conducted each time a draft Monthly Invoice submittal is made. The meeting shall be used to verify, address, and finalize the following:

1. Actual start dates
2. Actual and planned Completion Deadlines
3. Earned value of Work that has been Accepted and reported in-place, based on installed quantities and Material on Hand (stockpiled Materials)
4. Activity percent complete
5. Incorporation of Approved Change Orders
6. Verification of unit-price items, if any

## **Book 2 Section 2: Project Management**

7. Status of outstanding Nonconforming Work
8. Completion of Value Engineering Change Proposals, if any
9. Work performance
10. Project Schedule, including changes from previous month's Schedule Critical Path(s)

Following the progress status meeting, CDOT shall have up to five Working Days to review, verify, and comment on the draft invoice submittal. After reviewing, CDOT will return the draft for the Contractor to revise and correct. The Contractor shall then submit a corrected and final Monthly Invoice to CDOT for Approval. Approval of the final Monthly Invoice will be issued within seven Working Days, contingent upon the Contractor's satisfactory resolution of CDOT's comments of the draft invoice submittal.

### **2.1.3 Schedule Management**

#### **2.1.3.1 General**

The Work specified in this subsection includes preparing, progressing, revising, and submitting Contract Schedules.

The Contract Schedules shall represent a practical plan to complete the Work within the Completion Deadlines and convey the intent in the manner of the prosecution and progress of the Work.

The Contract Schedules shall include the planned execution of the Work in accordance with the Contract Documents. The Contract Schedules shall include involvement and coordination with other Contractors, Utility Owners, Governmental Persons, Engineers, Architects, Subcontractors, and Suppliers in the development of the Original Initial Schedule, Revised Initial Schedule, and updating of subsequent Monthly Progress Schedules. Schedules shall include discipline review and approval durations as required by CDOT. Concurrent review may be utilized if approved in advance by CDOT.

The Contract Schedules shall represent the requirements of the Contract Documents and the Work shall be executed in the sequence and duration indicated in the Contract Schedules.

All Contract Schedules shall be developed consistent with the Accepted WBS and the Completion Deadlines.

#### **2.1.3.2 Contract Schedule and Term Definitions**

Contract Schedules shall include the Preliminary Initial Schedule, Original Initial Schedule, Current Initial Schedule, Revised Initial Schedule, Monthly Progress Schedule, Recovery Schedule, and the As-Built Schedule.

##### **2.1.3.2.1 Preliminary Initial Schedule**

The Preliminary Initial Schedule is defined as the initial schedule for the purpose of initiating Work on the Project. It shall be a Critical Path Method (CPM) schedule with Activities for the first three months following NTP1 and shall be cost-loaded to WBS Level VII. The Preliminary Initial Schedule shall conform to the Accepted WBS and include all CDOT and Contractor-defined WBS Level VI and VII Activities.

##### **2.1.3.2.2 Original Initial Schedule**

The Original Initial Schedule is defined as the Contractor's original plan for the Project from NTP1 through Interim Acceptance. It shall be a detailed CPM Schedule with Work Activities and Completion Deadlines included for the full term of the Project. The Original Initial Schedule shall be developed from the Preliminary Initial Schedule and shall conform to the Accepted WBS and include all CDOT and

## **Book 2 Section 2: Project Management**

Contractor defined WBS Level VI and VII Activities. The Original Initial Schedule shall not change after Approval.

The Original Initial Schedule shall be cost loaded to WBS Level VII and summarized for the aggregate costs equal to the WBS Level V prices set forth in the Proposal Documents.

### **2.1.3.2.3 Current Initial Schedule**

The Current Initial Schedule is defined as the Original Initial Schedule with cost and Schedule changes from Approved Change Orders incorporated. It shall be updated monthly with only Approved cost and Schedule changes. This Schedule will not show progress but shall maintain the original data date from the Original Initial Schedule as a baseline. The Current Initial Schedule shall be submitted to CDOT for Acceptance with each Monthly Invoice.

The Current Initial Schedule shall be cost loaded to WBS Level VII and summarized for the aggregate costs equal to the WBS Level V, and any Level VI, prices set forth in the Proposal Documents as adjusted for Approved Change Orders.

### **2.1.3.2.4 Revised Initial Schedule**

The Revised Initial Schedule is defined as the Contractor's plan for the Project which is current with progress to date. This Schedule shall reflect the planned execution of the Work for the remainder of the Project along with a reallocation of the remaining resources and quantities to represent the estimate to complete the Work as adjusted for Approved Change Orders. A Revised Initial Schedule must be Approved by CDOT. Such Approval shall only apply to the scheduled Work that is planned after the Schedule's Approval date.

The Revised Initial Schedule shall be prepared by the Contractor when requested by CDOT. The Contractor may request that CDOT review and Approve a Revised Initial Schedule at any time. However, such review and Approval will be undertaken only if CDOT agrees with the need for such revision.

The Revised Initial Schedule shall be cost loaded to WBS Level VII and summarized for the aggregate costs equal to the WBS Level V, and any Level VI, prices set forth in the Proposal Documents as adjusted for Approved Change Orders.

### **2.1.3.2.5 Monthly Progress Schedule**

The Approved Original Initial Schedule, Current Initial Schedule, or Revised Initial Schedule shall be used as the basis to establish the Monthly Progress Schedule. It shall be updated every month to show the actual progress of Work and the earned value of Work accomplished, including Approved Change Orders.

The Monthly Progress Schedule shall be cost loaded to WBS Level VII, and when summarized for the aggregate costs of WBS Level V Activities, shall equal the WBS Level IV prices set forth in the Proposal Documents as adjusted for Approved Change Orders. In addition, the Monthly Progress Schedule shall include WBS Level VI detail for the upcoming three months of design and construction on the Project, except that cost loading to WBS Level VI is not required for the three month look-ahead.

### **2.1.3.2.6 Recovery Schedule**

The Recovery Schedule is defined as the Contractor's proposed plan for the recapture of lost schedule progress and to achieve Project Completion or Interim Acceptance by the applicable Completion Deadlines. The Recovery Schedule shall be based on the latest Accepted Monthly Progress Schedule and

## **Book 2 Section 2: Project Management**

shall include equivalent detail. The Recovery Schedule shall show the proposed changes to the Schedule, include cost loading and additional detail to substantiate the recovery plan, and shall reflect all proposed changes to WBS Level VI Activities through Project Completion.

The Recovery Schedule shall be cost loaded to WBS Level VI and, when summarized for the aggregate costs of WBS Level V Activities, shall equal the WBS Level IV prices set forth in the Proposal Documents as adjusted for Approved Change Orders.

### **2.1.3.2.7 As-Built Schedule**

The Current Initial Schedule, or last Revised Initial Schedule, submitted shall be identified by the Contractor as the As-Built Schedule. The As-Built Schedule shall reflect the exact manner in which the Contractor executed the Work (including start and completion dates, Activities, actual durations, sequences, and logic), and shall be signed and certified by the Engineer and the Contractor's scheduler as being a true reflection of the way in which the Work was executed at the time of Interim Acceptance. This certified As-Built Schedule must be Accepted before the final Retainage is released.

### **2.1.3.2.8 Float**

Float is defined as the amount of time between the early start date and the late start date, or the early finish date and the late finish date, for each and every Activity in the Schedule. Float shall be for the benefit of all parties to the Contract and not for the exclusive benefit of the Contractor. Suppression or consumption of Float by extended Activity duration, dummy Activities, or preferential sequencing will not be allowed. Critical Activities shall be defined as Activities with a total Float less than 10 days.

### **2.1.3.3 Schedule Requirements**

1. General Scheduling Constraints
  - A. All Contract Schedules shall be in the same master data file, including design, submittals, procurement, and construction Schedules. These Work Activity Schedules shall all tie together logically to present a total Critical Path analysis in the same master data file.
  - B. The only constraints allowed to be included in the Schedule are the Contract Deadlines. No intermediate completion constraints or start constraints shall be allowed unless they are included in the Contract. Unless Approved by CDOT, all Activities must have at least one predecessor and one successor, except for NTP1 (no predecessor) and Interim Acceptance (no successor).
  - C. All Activities that start or complete out of sequence shall be rescheduled (logic corrected) to reflect the actual sequence of events.
  - D. Actual start and completion dates shall be accurately input. Prior to changing or correcting any previous actual dates, or dates required in the Contract, a narrative shall be written to CDOT requesting Approval to change such a date.
  - E. If any logic is changed after the Approval of the Original Initial Schedule or Revised Initial Schedule, if one exists, a narrative by Activity code shall accompany the Monthly Progress Schedule stating the reason the logic changed and the benefit to CDOT. If CDOT does not agree with the reason for the logic change, the Monthly Progress Schedule will not be Accepted.
  - F. All Activity identification codes for a specific Activity description created in any Contract Schedule shall remain unchanged and connected to its original Activity description through Interim Acceptance. An Activity description may only be changed to clarify an Activity's original scope.

## **Book 2 Section 2: Project Management**

2. CPM Requirements
  - A. The Critical Path shall be determined according to CPM principles and shall be highlighted in “RED” on all Schedules to distinguish critical Activities from other Activities. A diamond, flag, or other symbol shall highlight milestones.
  - B. The CPM shall have all major procurement Activities identified for any item with more than 30 days of lead time for delivery. This includes Shop Drawing submittal and approval, lead times for the fabrication and delivery of Materials and Equipment, and installation of Materials and Equipment.
  - C. The CPM shall be sufficiently detailed to accurately depict all the Work. Activity durations shall be an estimate in Working Days of the time required to perform each Activity. No individual Activity will have a duration exceeding 30 Working Days without prior Approval from CDOT. Activities with durations of less than five Working Days shall be held to the absolute minimum. For an Equipment or Material fabrication item whose duration exceeds 30 Working Days, several Activities, none exceeding 30 Working Days, shall be used. Each Activity shall have a detailed description.
  - D. Contract Completion Deadline dates shall be shown on the CPM. These dates shall be input as finish constraint dates and shall agree with such dates specified in the Contract.
  
3. Schedule Output Format

The Contractor shall submit the electronic output files of the Schedule in Microsoft Project 2010. The Schedule charts and graphs shall be submitted in Adobe PDF. These files shall be submitted with the Monthly Progress Schedule.

### Execution

- WBS Activities and Schedule Modifications

When it becomes necessary to add, combine, eliminate, or modify Contract-specified WBS Level VI or VII Activities to reflect modifications to the Work, such changes shall be made through a Change Order that has been Approved by CDOT in accordance with the Contract. These changes to the WBS Level IV or V Activities shall consequently be reflected in subsequent Schedule submittals. Alternately, if a proposed addition, combination, elimination, or modification of WBS Level VI or VII Activities would not be the subject of a Change Order, then the consequent realignment of funds between Level V Schedule Activities must be Approved by CDOT in accordance with the Contract and thereafter reflected in the required Schedule submittals.

- Preliminary Initial Schedule

The Contractor shall submit the Preliminary Initial Schedule to CDOT for Acceptance at least 10 days prior to NTP1. The Preliminary Initial Schedule shall be in accordance with the Contract requirements, consistent with the Accepted WBS, and be cost loaded to WBS Level VII Activities and include Contractor-defined detail necessary to provide measurable Schedule progress. The Accepted Preliminary Initial Schedule shall provide an intermediate Schedule during the production of the Original Initial Schedule and shall establish a payment schedule for the duration between NTP1 and NTP2.

## **Book 2 Section 2: Project Management**

- Original Initial Schedule

The Original Initial Schedule shall show the sequence and interdependence of Activities required for complete performance of the Work, beginning with the date of NTP2, and concluding with the date of Interim Acceptance and shall comply with the following:

The actual number of Activities in the Schedule shall be sufficient to assure adequate planning of the Work and to permit monitoring and evaluation of progress and the analysis of time impacts. Activity durations shall be expressed in Working Days. The Work calendar shall clearly identify Holidays and other non-Working Days, as well as Special Events.

The Contractor shall schedule deliverable review times by CDOT and Governmental Approvals as separate tasks logically tied to the appropriate Activity. Concurrent review of multiple deliverables by one discipline must be agreed to by CDOT, prior to inclusion in the Original Initial Schedule.

A graphic representation of all Activities necessary to complete the Work shall be provided.

All Completion Deadlines set forth in the Contract shall be identified.

Not later than 15 days prior to issuance of NTP2, the Contractor shall submit to CDOT for Approval the final Original Initial Schedule. Once Approved, this schedule shall become the Original Initial Schedule against which all progress and revisions shall be measured.

The Original Initial Schedule will be reviewed by CDOT for purposes of determining:

- Compliance with applicable provisions of the Contract Documents.
- The logic of the proposed CPM schedule is sound and consistently developed and demonstrates a logical sequencing and interdependence of Activities required for the timely and orderly achievement of all Work Activities and milestones, including completion of the Work within the Completion Deadlines.

Upon Approval by CDOT, the Original Initial Schedule shall be employed as the basis for the Monthly Progress Schedule by the Contractor in its scheduling and performance of the Work.

- Monthly Progress Schedule

The Monthly Progress Schedule shall be submitted each month to CDOT for Acceptance, concurrent with the invoice submittal as required herein. The Monthly Progress Schedule shall include all information current as of the status date.

For the three month look-ahead portion of the Monthly Progress Schedule that establishes the WBS Level VI Activities, the Contractor shall provide sufficient detail to convey a Schedule that provides weekly Schedule control and shall specifically identify:

1. Completion Deadlines, if any.
2. Phasing of design, construction, testing, and staging of the Work as specified shall be prominently identified. Particular attention shall be given to release for construction dates, Site availability, construction staging, and maintenance and protection of traffic requirements of the Contract.

## **Book 2 Section 2: Project Management**

3. Procurement, fabrication, preparation of mock-ups, preparation of prototypes, delivery, installation, testing of Materials and Equipment, including factory testing and demonstration testing, and any long lead time (over 30 days) orders for Material and Equipment.
4. Interface coordination and dependencies with preceding, concurrent, and follow-on Contractors.
5. Work to be performed by other Contractors and agencies that may affect the Schedule.

Prior to the progress status meeting, the Contractor shall obtain from the design team, Subcontractors, Suppliers, and field staff the necessary information as required to accurately reflect progress to date.

### **2.1.3.3.1 Recovery Schedule**

If the Work is lagging the late start cost curve in the Current Initial Schedule for a period which exceeds the greater of (a) 15 days in the aggregate, or (b) that number of days in the aggregate that equals five percent of the days remaining until the Project Completion Deadline, the Contractor shall prepare and submit to CDOT for Approval, a Recovery Schedule within 14 days after the Contractor first becomes aware of such Schedule delay.

The Recovery Schedule shall demonstrate the Contractor's proposed plan to regain lost Schedule progress, as well as demonstrate how Project Completion and Interim Acceptance of the Project shall be achieved by the Project deadlines.

CDOT will notify the Contractor within 14 days after receipt of the Recovery Schedule whether the Recovery Schedule is Approved, or will describe changes that CDOT believes should be made to the Schedule. The Contractor shall incorporate and fully include the Recovery Schedule (including CDOT's comments) into the next scheduled Monthly Progress Schedule (or, if the next scheduled Monthly Progress Schedule is due within seven days of Approval of the Recovery Schedule, then the Recovery Schedule shall be incorporated into the subsequent Monthly Progress Schedule), and shall concurrently provide to CDOT a Revised Initial Schedule.

## **2.1.4 Meetings**

### **2.1.4.1 Task Force Meetings**

At a minimum, the Contractor shall conduct Task Force Meetings for the following disciplines to facilitate "Over the Shoulder" review of the design:

1. Tunnel Enhanced Fire Safety System
2. Drainage
3. Environmental

### **2.1.4.2 Safety Meetings**

The Contractor shall conduct regularly scheduled Project Safety Meetings, tool box talks, etc., as specified in their Project Safety Management Plan and as per the Standard Specifications.

## **2.1.5 Photographs**

### **2.1.5.1 Progress Photographs**

The Contractor shall take Project photographs of the Work Site every month as a minimum. Photographs shall include all areas under construction, whether temporary or permanent, and all other areas impacted, each time they are taken. CDOT's confirmation shall be sought regarding views to be taken and the approximate time at which they will be taken.

## **Book 2 Section 2: Project Management**

The Contractor shall provide one complete set of high quality digital format photographs on CD, DVD, or USB memory when taken. The file format shall be .jpg, .gif, or .tiff.

The Contractor shall provide interior and exterior photographs of each buried structure just prior to burial. Provide a minimum of four internal views (as applicable) and four external views of each structure. Place the following information on the front of digital photographs:

1. Date photograph was taken
2. Structure identification
3. Title of Project
4. Description of view shown in photograph
5. Identification of photographer
6. Sequential number of photograph

### **2.1.5.2 Pre-Construction Photographs**

Immediately after NTP1, the Contractor shall take and label a sufficient number of pre-construction photographs and a high quality video of the Site, including Roadways within the tunnels, Tunnel Interiors, Ventilation Ducts of both tunnels, Existing Water Supply Tank, Structures, Drainage pipe network, existing Landscape, and all areas necessary and/or anticipated to be impacted by the Work in HD format so as to resolve any disputes which may arise regarding the conditions prior to and subsequent to construction. Such pre-construction survey shall be completed prior to NTP2. If a dispute arises where no or insufficient photographic or video evidence of the existing condition is available, the disputed area shall be restored to the extent directed by CDOT at no additional cost to CDOT.

## **2.2 Office Facilities and Options**

### **2.2.1 Office**

Intentionally left blank.

### **2.2.2 Design Build Field Laboratory (Owner Verification Testing)**

Intentionally left blank.

### **2.2.3 Field Facilities (Field Office Only)**

Intentionally left blank.

### **2.2.4 Communications Equipment**

Communications in the EJMT are critical. The Contractor and CDOT shall be required to be in constant communication during the course of the Project.

The Contractor shall supply hand held portable radios to be used by all Contractor personnel when on the Project for communications with CDOT. The radios shall be 16 channel/scanning, five watt hand held, capable of being programmed for selected frequencies in the vicinity of 453.200 MHz. The radios shall be in good working order. The radios shall be capable of operation remotely or from a vehicle. The Motorola Radio HT 1250 UHF version model # AAH25SDH9DP5AN with required attachments is known to meet these requirements. Prior to ordering, the Contractor shall submit trade numbers and specification of radios to CDOT for Acceptance. The necessary UHF frequencies will be furnished by CDOT. The number of radios required shall be sufficient to supply each active Contractor personnel a radio while on the Project.

## **Book 2 Section 2: Project Management**

### **2.2.5 Project Vehicles**

Intentionally left blank.

### **2.2.6 Project Directory**

The Contractor shall maintain and furnish to CDOT a Project Directory listing the names, addresses, and telephone numbers (office, home, cellular, etc.) of the Key Personnel and critical support staff of the Contractor and each Subcontractor. The Project Directory shall be submitted to CDOT for review prior to issuance of NTP2. The Contractor shall update the Project Directory quarterly for the duration of the Work.

## **2.3 Safety Management**

### **2.3.1 Project Safety Management Plan Submittal**

The Contractor's Project Safety Management Plan (PSMP) (Standard Specifications, Subsection 107.06) must be submitted for review and Acceptance prior to receiving NTP2 or any work element requiring implementation of the Project Safety Management Plan.

The PSMP is a living document and shall be updated when a process, method, chemical, or other Work criteria changes that affects the safety of a person or property. The updated portion of the PSMP must be submitted for review.

### **2.3.2 Project Safety Management Plan Criteria**

The PSMP must answer the "who, what, and how" based upon the technical requirements contained within Book 2 of the RFP and the 12 elements identified in the Standard Specifications, Subsection 107.06.

### **2.3.3 Project Safety Management Plan Training and Communication**

All of the Contractor's Project staff, including CDOT and Subcontractors, must be trained on the elements of the Contractor's Accepted PSMP submittal.

## **2.4 Document Management**

The Contractor shall establish and maintain its own Document Control System (DCS) to store and record all correspondence, drawings, progress reports, technical reports, specifications, Contract Documents, deliverables, calculations, and administrative documents generated under the Contract. Document Control, storage, and retrieval methods shall include the use of both hard copies and electronic records. The Contractor's DCS shall handle all Project documents.

All correspondence of the Contractor to and from CDOT and its representatives with respect to the Contract shall be serialized, and the Contractor shall maintain separate incoming and outgoing correspondence logs. At a minimum, a serialization similar to the following is required:

**Book 2 Section 2: Project Management**

DATE: _____
DBC Assigned No.: _____
DB-(year): _____
Addressee: _____
Address: _____
Subject: _____
Reference: _____
Copies: _____

*Example Document Serialization*

All correspondence shall include the Project name, Contract name and number, along with the specific subject of the letter. All replies shall refer specifically to prior correspondence to which it relates.

The Contractor shall make available, when requested by CDOT, copies of its logs indicating CDOT's outstanding items and a copy of any document requested within 24 hours.

## 2.5 Deliverables

At a minimum, the Contractor shall submit the following to CDOT for Review, Approval, or Acceptance:

**Table 2-2: Deliverables by the Contractor**

<b>Deliverable</b>	<b>Review, Acceptance, or Approval</b>	<b>Schedule</b>
Preliminary Initial Schedule & WBS	Acceptance	At least 10 days prior to NTP1
Methods Statements	Review	Prior to NTP2
Draft Monthly Invoices	Acceptance	Within 5 Working Days following prior month's end concurrent with the progress status meeting
Monthly Invoice format changes	Approval	At least 15 days prior to first invoice and before NTP2
Monthly Progress Report	Acceptance	Concurrent with Monthly Invoice
Final Monthly Invoices	Approval	Within 7 Working Days following CDOT's Acceptance of the draft Monthly Invoice.
Current Initial Schedule	Acceptance	Concurrent with Monthly Invoice
Revised Initial Schedule	Approval	Upon CDOT's or Contactor's request
As-Built Schedule	Acceptance	Before the release of final Retainage
Changes to Schedule Requirements	Approval	According to Section 2.1
Original Initial Schedule	Approval	15 days prior to issuance of NTP2
Monthly Progress Schedule	Acceptance	Concurrent with Monthly Invoice
Recovery Schedule	Approval	According to Section 2.1.3.3.1
Project Directory	Review	Prior to NTP2
Project Safety Management Plan	Acceptance	Prior to NTP2 or any work element requiring implementation of the Project Safety Management Plan.

All deliverables shall also conform to the requirements of Book 2, Section 3.