Massachusetts Bay Transportation Authority

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| Rev. #2 – May 2012Rev. #1 – November 2003 |

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|  Design & Construction Department  |
| Resident Engineer’s Manual  |
| Revision No. 2 |

**I – INTRODUCTION**

The purpose of this manual is to establish general principles, guidelines and procedures for the management of MBTA construction projects from an on-site perspective. Generally, the majority of on-site activities are managed by Resident Engineers, assisted by their Inspectors. This on-site management function is periodically supplemented by specialized assistance in the form of Safety, Quality Assurance, Environmental, Geotechnical, Survey, and/or Design input as requested directed, or assigned. In all cases, however, the Resident Engineer (RE) is expected to be the primary point of contact for a job site and acts as the principal MBTA site management representative.

The MBTA performs the majority of its construction through the use of private sector General Contractors, with some small fraction of our construction work performed by in-house personnel. Occasionally, work is performed on MBTA property by other public sector agencies such as the Commuter Rail Operator, MassDOT, the Massachusetts Port Authority or other State or Local entities; however, MBTA Construction personnel will continue to provide site surveillance and inspection services to ensure that agreed-upon standards are met.

In cases where work is performed by private sector Contractors, the Contractors essentially control their own destinies (within the terms of the Contract). They hire, fire, and control their workforces; set their own priorities and schedules (as allowed under the constraints of the Contract); must obey all applicable laws, including labor, safety, environmental, noise, and other restrictions; and must follow the MBTA Contract Plans, Specifications, and project schedule. It is the Resident Engineer’s and Inspector’s responsibility to ensure the contractor’s compliance.

Resident Engineers fulfill a Construction Management role, generally defined as one that documents and ensures that the work performed satisfies all required safety, quality, schedule, budget, and environmental specifications and standards.

This manual defines the duties and responsibilities of the MBTA field construction staff and stipulates specific authorities, responsibilities, procedures, and documentation/reporting requirements. The manual is meant to be a guide to help the Resident Engineers fulfill their responsibilities and to manage our construction projects to successful completions.

The Resident Engineer must be mindful that the procedures in this manual are intended to assist him/ her employ best practices. On a more practical level, however, the Resident Engineer must be prepared to supply the documentation required in this manual to a variety of auditors who frequently visit the MBTA to confirm these procedures are being followed. Auditors often request that documentation be supplied in electronic format, so to the extent possible, the Resident Engineer should maintain electronic files.

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**GUIDANCE**

MassDOT Standard Specification (formerly known as MHD Blue Book)

MBTA website [www.mbta.com](http://www.mbta.com)

MBTA Standard General Conditions/Specifications

MBTA Project Controls Manual

MBTA Project Manager’s Manual

MBTA Change Order Guidelines

D&C Monthly Bulletins

Capital Management System (CMS)

D&C Document Control Process

FTA website [www.fta.dot.gov](http://www.fta.dot.gov)

FTA Circular 4220.1F – Third Party Contracting

Frequently Asked Questions

Best Practices Procurement Manual

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| **RESIDENT ENGINEER’S MANUAL** | **Section 1** |
| **TITLE**: Role of the Resident Engineer | **Date:** 05/04/12 |

**1.1 Purpose and Scope**

To establish the duties and responsibilities of the Resident Engineer on MBTA Design & Construction projects.

**1.2 References**

1.2.1 Resident Engineer’s Procedure Section 3, Filing System/Records

1.2.2 Resident Engineer’s Procedure Section 8, Submittals

1.2.3 Quality Assurance Procedure QAP-12.1, Problem Identification and Resolution

1.2.4 Resident Engineer’s Procedure Section 2, Meetings

1.2.5 Resident Engineer’s Procedure Section 4, Pre-Construction Activities

**1.3 General**

The MBTA Assistant General Manager for Design & Construction (AGM) delegates to the Resident Engineer the authority to be the MBTA representative for all site and work-related issues. Directors of Design and Construction and Project Managers may supplement this authority as needed. The Resident Engineer **does not** have the authority to commit public funds.

**1.3.1 The MBTA – Contractor Relationship**

The relationship between the MBTA site staff (Resident Engineer and Inspectors) and the Contractor is as important to the success of the project as any other single factor. Progress depends on establishing clear, professional communications early in the course of the project, where the roles of each participant are recognized and understood. Differences of opinion are to be expected; however, they are to be settled quickly and professionally so that construction can progress without lingering resentment between parties.

Some guidelines the Resident Engineer should follow to establish an effective relationship includes:

1. Avoid Conflict of Interest – Don’t ever put yourself in a situation that would even appear to be accepting a favor from a Contractor.
2. Be as quick to praise good work as you are to criticize inadequate work. At all times be candid but diplomatic about the Contractor’s performance.
3. Keep good records. Don’t depend on personal memory or verbal commitments – put things in writing. Follow up with emails and formal memorandums (Exhibit 1) depending on the severity of the direction. Err to the side of recording too much than not enough. Establishing a formal, professional and documented relationship with the Contractor early in the project can help avoid communication problems and claims later in the job.
4. Be one step ahead. Plan a month ahead, a week ahead, and a day ahead.
5. Know every part of the contract documents, including specifications, drawings, contract terms, etc
6. Schedule job meetings on a regular basis and issue minutes (See Section 2).
7. Perform regular site inspections.
8. If quality, safety and environmental requirements are not met, the job is a failure, even if it is completed on time and under budget!
9. Ask for assistance immediately when you need it.
10. Accept assistance even when you feel it is not needed (such as visits by Safety, Environmental, and Quality Assurance).
11. Regularly check the progress of the work against the project schedule and completion dates (milestones). Require that the Contractor submit recovery schedules when needed. Refer to the MBTA Project Controls Manual for schedule requirements.

**1.3.2 Responsibilities of the Resident Engineer**

The six key responsibilities of a Resident Engineer at a project site are:

1. Track progress and process Contractor payment estimates based on accepted installed quantities or project CPM schedules.
2. Coordinate, review and process change orders in accordance with the MBTA Change Order Guidelines.
3. Facilitate communication between the MBTA and the Contractor and others, including the Designer, the public and other agencies.
4. Ensure that the work is performed in compliance with the contract documents, or using approved substitute materials, methods or designs.
5. Maintain records that document the job. (See Section 3)
6. Direct the activities of the MBTA site personnel under their supervision to assist in these responsibilities.

**1.3.3 Duties of the Resident Engineer**

Ideally, a Resident Engineer would be assigned early enough in the design process to participate in constructability reviews, assist the design staff with construction input and assist during the procurement phase (especially at pre-bid and pre-construction meetings).

Prior to Construction:

When assigned prior to construction, the Resident Engineer may be called upon to perform, assist with or participate in the following pre-construction activities:

* Develop the contract package
* Verify quantities
* Participate in constructability reviews
* Set-up project files
* Participate in specialized training as needed (includes safety and environmental matters and inspection staff)
* Attend pre-bid meetings and pre-construction briefings and meetings
* Confirm all work is associated with pay items

After Notice-to-Proceed:

When the Notice-to-Proceed is issued to the Contractor, the construction phase of the project begins and the Resident Engineer becomes the key MBTA representative for the on-site work. The Resident Engineer’s duties include:

* Ensure a safe, quality job.
* Conduct periodic safety walks
* Interface with the Contractor (as well as MBTA Construction and other Departments, the Designer, and others) for all site matters.
* Supervise the activities of MBTA site personnel.
* Process all submittals. (See Section 8)
* Hold regularly scheduled meetings with Contractor(s), and review and issue minutes of meetings (usually prepared by the Designer) in accordance with Section 2.
* Track the progress of the job against the project schedule.
* Facilitate timely resolution of construction problems (whether related to schedule, cost or technical issues).
* Perform inspections, assign Inspectors, ensure that the work conforms to the Contract Documents and assure that inspections are properly documented.
* Conduct regular inspections of work and documentation.
* Maintain project files and control documentation.
* Log and process Resolution Reports. (See Reference QAP–12.1)
* Process pay estimates.
* Participate in negotiations.
* Process Change Orders in accordance with MBTA Change Order Guidelines.
* Provide status reports.
* Close out the job.

**1.4 Procedure – None**

|  |  |
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| **RESIDENT ENGINEER’S PROCEDURE** | **Section 2** |
| **TITLE**: Meetings | **Date:** 05/04/12 |

**2.1 Purpose and Scope**

To establish the requirements and methods to document results of meetings and telephone conversations that relate to the project. This procedure applies to all project meetings and those telephone conversations that are important enough to require documentation.

**2.2 References**

 Project Manager’s Manual

 RE’s Manual, Section 6 Project Diary

 RE’s Manual, Exhibit 2.1 – Meeting Minute Template/Sample

**2.3 General**

**2.3.1** During the execution of construction contracts, many meetings and telephone conversations will occur that have a material effect on how we operate or conduct our business. It is very important that these meetings and conversations become documented in the project files and project diaries to substantiate and record how decisions were arrived at and what actions were taken on the project.

**2.3.2** Minutes of meetings shall be completed within seven (7) days of the meeting.

**2.3.3** Telephone conversations shall be documented immediately upon completion of the telephone call.

**2.3.4** The format of the “Meeting Minutes” shall include the following information:

* Place and date of the meeting.
* Party calling the meeting.
* Parties represented and by whom (Attach an Attendance Sheet, Exhibit 2.2)
* Items considered/discussed at the meeting.
* Decisions made or arrived at during the meeting.
* Instructions received at the meeting or as a result thereof.
* Remarks and recommendations.
* Open/action items.

**2.3.5** Responsibilities

The Resident Engineer is responsible to assure that all meetings that are project related are recorded. The Resident Engineer may delegate the responsibility to prepare the minutes.

Each person that has a telephone conversation that materially affects the project or where decisions have been made that should be recorded, is required to record conversation in the daily project diary and follow-up with an email confirmation/memorandum to impacted parties. If there is any question as to whether or not a conversation should be recorded, the PM should be consulted.

**2.4 Procedure**

2.4.1 When a meeting is convened on the project, the RE shall assure that someone at the meeting is assigned the responsibility to record the minutes on Exhibit 5.1, “Minutes of Meeting.” As each subject is discussed, it shall be recorded in the minutes. If actions are required of individuals, they shall be identified in the minutes along with an expected completion date.

2.4.2 An attendance sheet shall also be passed to each individual attending the meeting. Each person shall fill in their name, title, company affiliation, telephone number and email (See Exhibit 5.2).

2.4.3 Within seven (7) days after the conclusion of the meeting, the minutes shall be published to each individual in attendance. A copy of the attendance sheet shall be attached to the minutes. Minutes of Meetings shall be retained in the project files.

2.4.4 Each person that has a telephone conversation that materially affects the project or where decisions have been made that should be recorded, is required to record conversation in the daily project diary and follow-up with an email confirmation/memorandum to impacted parties. If there is any question as to whether or not a conversation should be recorded, the PM should be consulted.

**2.5 Exhibits**

Exhibit 2.1 - Meeting Minutes

 Exhibit 2.2 - Attendance Sheet

**Exhibit 2.1**

**MEETING MINUTES**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Progress Meeting Minutes *Template*** |  |  |  |  |
|  |  |  |  |  |  |  |  |
| **MBTA Contract No:** |  |  |  | **Next Meeting:** |  |
| **Contract Description:** |  |  |  | **Time:** |  |
| **Agenda:** |  |  |  |  |  | **Location:** |  |
| **Time:** |  |  |  |  |  |  |  |
| **Location:** |  |  |  |  |  | **Recorded By:** |  |
|  |  |  |  |  |  | **Attendees:** |  |
| **Item** |  | **Mtg#** | **Item description** | **Action** | **Due Date** | **Status** | **Notes** |
|  |  |  |  |  |  |  |  |
| **1. GENERAL/WEEKLY WORK TOPICS** |  |  |  |  |
| **1.1** |  |  | **Acceptance of progress meeting # minutes** |  |  |  |
|  |  |  |  |  |  |  |  |
| **1.2** |  |  | **Safety** |  |  |  |  |
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|  | 1.2.2. |  | Safety Walk Update |  |  |  |  |
|  | 1.2.3 |  | Safety Issues |  |  |  |  |
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| **1.3** |  |  | **Items Distributed during Meeting for Discussion** |  |  |
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|  | 1.3.2 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
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|  | 1.4.1 |  | 3 Week Schedule Look-Ahead |  |  |  |  |
|  | 1.4.2 |  | Status of Monthly Update #\_\_\_\_\_ |  |  |  |  |
|  |  |  |  |  |  |  |  |
| **1.5** |  |  | **Requests for Information (RFIs)** |  |  |  |  |
|  | 1.5.1 |  | Review RFI Log |  |  |  |  |
|  |  |  |  |  |  |  |  |
| **1.6** |  |  | **SUBMITTALS** |  |  |  |  |
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|  |  |  |  |  |  |  |  |
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|  |  |  |  |  |  |  |  |
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|  | 1.9.1 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| **2** |  |  | **OLD BUSINESS** |  |  |  |  |
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|  | 2.2 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
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|  | 3.2 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| **4** |  |  | **CHANGE ORDERS** |  |  |  |  |
|  | 4.1 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| **5** |  |  | **ENVIRONMENTAL** |  |  |  |  |
|  | **5.1** |  |  |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |
| **ATTACHMENTS** |  |  |  |  |  |  |
|  | A |  |  |  |  |  |  |
|  | B |  |  |  |  |  |  |

**NOTES:**

**Exhibit 2.2**

**ATTENDANCE SHEET**

**LOCATION:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **DATE:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**SUBJECT:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**CONTRACT No:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**CONTRACT NAME:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**NAME, TITLE AFFILIATION TEL No. Email**

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| **RESIDENT ENGINEER’S PROCEDURE** | **Section 3** |
| **TITLE**: Filing System/Records | **Date:** 05/04/12 |

**3.1 Purpose and Scope**

This procedure establishes the requirements for the filing, storage and maintenance of project records.

**3.2 References**

 Resident Engineer’s Procedure, Section 10, Closing out the job.

**3.3 General**

**3.3.1 Definitions**

Master Records List – A listing of all project records and their retention periods.

Record Copy – The official copy of a document that will be turned over to records storage at the end of the project.

Record Retention Period – The period of time that a record is to be maintained after the project has closed.

 **3.3.2 Responsibilities**

 The Resident Engineer (RE) is responsible for:

1. Establishing the project filing system. The Resident Engineer shall develop a project specific site filing system when assigned to the project.
2. Assuring that the Project has a locked file cabinet with a minimum fire rating of 1 hour.
3. Maintaining records generated at the construction site.
4. Assuring that all project site records are turned over to the Document Control Manager at the end of the project.
5. Assessing on a periodic basis that project records are clear, complete and up-to-date at all times.

**3.3.3** The records generated during the execution of a project will be retained by the MBTA for future reference; therefore, it is important that files are orderly and maintained accurately.

**3.4 Procedure**

**3.4.1** When the Resident Engineer (RE) is assigned to the Project, the RE shall establish a filing system for all project site records. The RE should open a filing section for each payment item and/or work activity listed in the project specifications. If necessary, the RE shall file the same document in multiple locations.

**3.4.2** A job-specific file index and project records list shall be developed using the Project Filing Index/Master Records List, Exhibit 5.1 as a base. It is important to remember that each project will have unique file items that are not included on all projects. The project filing system should be customized to suit each project’s specific requirements. The Master Records List portion of Exhibit 5.1 details most of the records generated on the project and the record retention period.

**3.4.3** As records are generated the RE shall assure that the records are legible, accurate, and filled out appropriate to the status of the work.

**3.4.4** Records shall be stored in secure files and only authorized personnel allowed access.

**3.4.5** At the conclusion of the work, the records will be transferred to the Records Retention Facility. (See Section 10)

**3.4.5.1** All permanent files should be packed in storage boxes which are marked with a list of the contents. Each box should be numbered sequentially and have the Contract number clearly marked on it along with a Document Control Catalog tag. Refer to the Project Management Manual, Section 10 – “Project Closeout” for details.

**3.4.5.2** For records generated by computer, a hard copy file shall also be maintained. This will normally be the signed copy. Electronic files shall be appropriately identified to allow for easy access.

**3.4.5.3** After the contract has been completely closed out, the Resident Engineer shall contact the Document Control Manager for transfer of records to the archives.

**3.5 Exhibits**

 Exhibit 3.1 - Project Filing Index/Master Records List

**Exhibit 3.1**

|  |
| --- |
| **PROJECT FILING INDEX/MASTER RECORDS LIST** |
|  |  |  |
| **SECTION** | **DESCRIPTION** | **RETENTION PERIOD**  |
| **1** | **CONTRACT DOCUMENTS** | **from Contract to Closeout** |
| 1.1 | Copy of Original Contract  | 7 yrs |
| 1.1.1 | Copy of Contract Change  | 7 yrs |
| 1.1.1.1 | Copy of Change Order No. 1 | 7 yrs |
| 1.1.1.2 | Copy of Change Order No. 2 | 7 yrs |
| 1.1.1.3 | “etc. |  |
|  |  |  |
| 1.2 | Notice to Proceed | 7 yrs |
| 1.2.1 | Notice of Award  | 7 yrs |
|  |  |  |
| 1.3 | Original Contract Drawings (in racks) | 7 yrs |
| 1.3.1 | Revised Contract Drawings | 7 yrs |
| 1.3.2 | “etc. |  |
|  |  |  |
| 1.4 | Intentionally Blank  |  |
|  |  |  |
| 1.5 | Submittal Log  | 7 yrs |
| 1.5.1 | Submittal No. 1 | 7 yrs |
| 1.5.2 | Submittal No. 2 | 7 yrs |
| 1.5.3 | Submittal No. 3 | 7 yrs |
| 1.5.4 thru x | Submittal No.’s as needed | 7 yrs |
|  |  |  |
| 1.6 | Shop Drawing Log | Lifetime |
| 1.6.1 | Shop Drawing No. 1 | Lifetime |
| 1.6.2 | Shop Drawing No. 2 | Lifetime |
| 1.6.3 | “etc. |  |
|  |  |  |
| 1.7 | Permits | 7 yrs |
| 1.7.1 | Fire/Burn Permit  | 7 yrs |
| 1.7.2 | Excavation Permit | 7 yrs |
| 1.7.3 | “etc. |  |
|  |  |  |
| 1.8 | Resolution Report Log | 7 yrs |
| 1.8.1 | Resolution Report No. 1 | 7 yrs |
| 1.8.2 | Resolution Report No. 2 | 7 yrs |
| 1.8.3 | “etc. |  |

|  |  |  |
| --- | --- | --- |
| **SECTION** | **DESCRIPTION** | **RETENTION PERIOD**  |
| 1.9 | Contract Facilities Turnover  | 7 yrs |
| 1.9.1  | Key Turnover | 7 yrs |
| 1.9.2 | Operations Manuals Turnover | Warrantee Period |
| 1.9.3 | Spare Parts Lists | Lifetime |
| 1.9.4 | Warranties and Guarantees | Warrantee Period |
| 1.9.5 | As-Builts | Lifetime |
|  |  |  |
| 1.10 | Real Estate, Easements, Right of Way | Lifetime |
| 1.11 | Contractor/Subcontractor/Vendor Performance Evaluation | 7 yrs |
|  |  |  |
| **2** | **CORRESPONDENCE** |  |
| 2.1 | Letters, MBTA to Contractor | 7 yrs |
| (Subcontractors via Contractor) |  |
| 2.2 | Letters, Contractor to MBTA | 7 yrs |
| 2.3 | Letters, Sub/Suppliers to MBTA | 7 yrs |
| 2.4 | Misc. Corres. (External) to MBTA | 7 yrs |
| 2.5 | Misc. Corres. (External) from MBTA | 7 yrs |
| 2.6 | Misc. Corres./Memos (Internal) to Project  | 7 yrs |
| 2.7 | Misc. Corres./Memos (External) from Project | 7 yrs |
| 2.8 | Memos to File | 7 yrs |
|  |  |  |
| **3** | **INSPECTION** |  |
| 3.1 | Daily Inspector’s Reports | 7 yrs |
| 3.2 | Other Inspection (Flagman, Traffic, etc.) Logs | 7 yrs |
| 3.3 | Resident Engineer’s Daily Reports | 7 yrs |
| 3.4 | Intentionally Blank | 7 yrs |
| 3.5 | Calculation Book | 7 yrs |
| 3.6 | Cost Control Ledger | 7 yrs |
|  |  |  |
| 3.7 | Concrete Logs | 7 yrs |
| 3.7.1 | Delivery Tickets | 7 yrs |
| 3.7.2 | Placement Requests | 7 yrs |
| 3.7.3 | Precast Inspection Reports | 7 yrs |
| 3.7.4 | Preplacement Inspection Reports | 7 yrs |
|  |  |  |
| 3.8 | Grout Log | 7 yrs |
| 3.8.1 | Test Reports | 7 yrs |
| 3.8.2 | Grout Inspection Reports | 7 yrs |
|  |  |  |
| 3.9 | Shotcrete Logs | 7 yrs |
| 3.9.1 | Shotcrete Inspection Reports | 7 yrs |
| **SECTION** | **DESCRIPTION** | **RETENTION PERIOD**  |
| 3.10 | Rebar Inspection Reports | 7yrs |
| 3.11 | Rock Anchor Tests/Inspection Reports | 7yrs |
| 3.12 | Soils Tests/Inspection Reports | 7yrs |
| 3.13 | Asphalt Tests/Inspection Reports | 7 yrs |
| 3.14 | Structural Tests/Inspection Reports | 7 yrs |
| 3.15 | Architectural Tests/Inspection Reports | 7 yrs |
| 3.16 | Mechanical Systems Tests/Inspection Reports | 7 yrs |
| 3.17 | Electrical Systems Tests/Inspection Reports | 7 yrs |
| 3.18 | Other Equipment Tests/Inspection Reports | 7 yrs |
| 3.19 | Contractor Equipment Inspections (Cranes, etc.) | 3 yrs |
|  |  |  |
| 3.20 to 3.30 | Other Tests/Inspection Reports | 7 yrs |
| 3.31 | Open Items List | 3 yrs |
|  |  |  |
| **4** | **SAFETY** |  |
| 4.1 | Contractor Safety Plan | 7 yrs |
| 4.2 | Contractor Safety Inspection Reports | 7 yrs |
| 4.3 | Contractor’s Tool Box Meetings | 7 yrs |
| 4.4 | Material Safety Data Sheets (MSDS) | 7 yrs |
| 4.5 | Accident Reports | 7 yrs |
| 4.6 | MBTA Safety Inspection Reports | 3 yrs |
| 4.7 | Safety Open Items List | 7 yrs |
| 4.8 | Safety Walk Documentation | 7 yrs |
| 4.9 to 4.x | Other Safety Items | 7 yrs |
|  |  |  |
| **5** | **ENVIRONMENTAL** | 7 yrs |
| 5.1 | Contractor’s Environmental Plan | 7 yrs |
| 5.2 | Insp. Reports | 7 yrs |
| 5.3 | MBTA Environ. Insp. Reports | 7 yrs |
| 5.4 | Environmental Open Items List | 7 yrs |
| 5.5 to 5.x  | Other Environmental Items | 7 yrs |
|  |  |  |
| **6** | **MEETINGS** |  |
| 6.1 | Pre-Bid Conference | Contract Closeout |
| 6.2 | Pre-Construction Mtg and Minutes | Contract Closeout |
| 6.3 | MBTA/Contractor Mtg and Minutes | 7 yrs |
| 6.4 | Misc. Meetings and Minutes | 7 yrs |
|  |  |  |
| **7** | **PHOTOGRAPHS** |  |
| 7.1 | Contractor Submitted Photos( Albums and Logs) | 7 yrs |
| 7.2 | MBTA Photos | 7 yrs |
| **SECTION** | **DESCRIPTION** | **RETENTION PERIOD**  |
| **8** | **COSTS, PAYMENTS & SCHEDULES** |  |
| 8.1 | Contractor’s schedules | 3 yrs |
| 8.2 | Contractor’s Schedule of Values (Lump Sum Breakdown) | 3 yrs |
| 8.3 | Cost Tracking/Estimate at Completion | 3 yrs |
|  |  |   |
| 8.4 | Pay Requests | 7 yrs |
| 8.4.1 | Pay Item Folders | 7 yrs |
| 8.4.1.1 |  |  |
| 8.4.1.2 | "etc.  |  |
|  |  |  |
| 8.5 | CQV | 7 yrs |
| 8.6 to 8.x | As needed | 7 yrs |
|  |  |  |
| **9** | **AS NEEDED** |  |
|  |  |  |
| **10** | **CERTIFIED PAYROLL** | 7 yrs |
| **11** | **LESSONS LEARNED** |  |

|  |  |
| --- | --- |
| **RESIDENT ENGINEER’S PROCEDURE** | **Section 4** |
| **TITLE**: Pre-Construction Activities | 05/04/12 |

**4.1 Purpose and Scope**

To outline the actions that the Resident Engineer performs if assigned during the design phase of the project.

**4.2 References**

Project Management Manual, Section 8, Project Coordination and Design Review Procedures

Resident Engineer’s Procedure, Section 3, Filing System/Records

Quality Assurance Procedure, QAP 16.1, Qualification and Certification of Inspectors

Resident Engineer’s Procedure, Section 8, Submittals

**4.3 General**

**4.3.1** The Resident Engineers may be called upon to become involved with a prospective construction project during the design stage. The RE may be requested to review drawings, plans, specifications, and other pre-construction documents. The RE may also be required to contact Construction field personnel (Inspectors), Engineering & Maintenance personnel, and the end-user operations staff (Commuter Rail, Light Rail, Rapid Transit, Bus, etc.) to understand the requirements of the project to assure that the project constructed as planned.

 **4.3.2 Project Development Process**

It is important that the Resident Engineer understand the project development process and sequence of events leading up to construction. Resident Engineers may be called upon to lend their expertise to the project team during the development of the project. The project process is outlined below. (Also see Section 1)

**4.3.2.1** The specific work that is to be included in a particular contract package is based on the needs of the end-user group (this could be any MBTA department, but is usually one of the Operations groups: Commuter Rail, Light Rail, Rapid Transit, or Bus).

**4.3.2.2** The design Project Manager is responsible for fully developing and coordinating all aspects of the project from beginning to end. This includes: Safety, Real Estate, Environmental, Inter-agency agreements, Design, Constructability reviews, Budget, Labor Relations, Community Relations, Contract Administration, Cost and Schedule, Quality Assurance, Risk, Inspection, and other management actions necessary to deliver a final product. The RE may be required to assist in any or all of these tasks.

**4.3.2.3** Design can be performed either in-house (partially or totally) or through the use of a Design Consultant, but at all times the assigned Project Manager is responsible for managing the total process. The RE may be called upon to assist the Project Manager.

**4.3.3 RESIDENT ENGINEER RESPONSIBILITIES**

* Provide advice, assistance, and review comments during the design process.
* Assist in constructability reviews, if assigned.
* Set up the project filing system (See Section 3). Obtain specifications. Most importantly, start to assemble a “record set” (not “as-builts”) of drawing and specifications by incorporating and posting all addenda into one master/record set. Control and posting of all drawing and specification, addenda and changes is vital. Without a “record set” of drawing and specifications, it is impossible to accurately inspect and control the job. It is also recommended that the drawings be broken down into “sub sets” by discipline (e.g., HVAC, plumping, mechanical, electrical, civil, structural, architectural, etc.) for easier access and use by Inspectors.
* Review the qualifications of Inspectors upon their assignment to the project to determine if the Inspectors are capable of performing their assigned tasks. Any required retraining (see Reference QA-16 Training and Certification of Inspectors) shall be coordinated with the Quality Assurance Department.
* Assign Inspectors to perform quantity take-offs of certain vital aspects of the job. This allows the Resident Engineer and staff to become more familiar with the details of the job, and better able to manage Contractor operations, payment requests and schedule calculations.
* Review the specifications in detail. The review should include but not be limited to the development of required submittal lists, such as: Contractor Quality Assurance Program, materials, shop drawings, subcontractors, concrete mix designs, inspection and test results, Certifications, mock-ups, etc. It is understood that a complete list of submittals cannot be developed in all cases; however, this time provides an ideal opportunity to identify and preplan activities.
* Identify areas which require coordination between the contractor, the RE and other MBTA groups such as Environmental, Quality Assurance Department, Safety, Bus or Rail Operations, etc. These matters should be discussed with the contractor at pre-construction meetings.
* Walk the job site as soon as possible.
* Attend the pre-bid, pre-award and pre-construction conferences and participate as needed.

**4.4 Procedure - None**

**4.5 Exhibits - None**

|  |  |
| --- | --- |
| **RESIDENT ENGINEER’S MANUAL** | **Section 5** |
| **TITLE**: Construction Activities | **Date:** 05/04/12 |

**5.1 Purpose and Scope**

 To establish the methods and procedures for controlling the work on MBTA projects.

**5.2 References**

 **2.1** Quality Assurance Procedure, QAP-12.1, Problem Identification and Resolution

 **2.2** Field Inspector’s Handbook, Field Office Management of Time and Material Work.

 **2.3** Quality Assurance Procedure, QAP-9.1, Inspection

 **2.4** Resident Engineer’s Procedure, Section 6, Project Diaries

 **2.5** Resident Engineer’s Procedure, Section 8, Submittals

**2.6** Resident Engineer’s Procedure, Section 2, Meeting

**5.3 General**

**5.3.1 Authority of the Resident Engineer**

The Resident Engineer is the Authority’s representative at the jobsite. All orders, decisions, etc. must be given by the Resident Engineer to or through the General Contractor. Likewise, all payrolls, estimates, etc. prepared by Subcontractors or suppliers must be submitted to the Resident Engineer through the General Contractor.

 The Resident Engineer must exercise due care and communicate with Contractors, Subcontractors and Suppliers only through authorized supervisory personnel and assure that Authority employees under the RE’s jurisdiction follow the same procedure.

 The Resident Engineer and the Inspectors are not, on any account, to direct or control the Contractor’s personnel, or to assume the function of a “walking boss” or foreman. Instructions regarding the work are to be given to Contractors only through proper, authorized channels.

 Remember, the Resident Engineer does not have the authority to commit public funds, or to revoke, alter, increase, decrease, relax or release any requirements of the Contract, or to issue instruction contrary to the Contract Drawings and Specifications.

 **5.3.2 Responsibilities**

The Resident Engineer is responsible for:

1. Assuring that contractors comply with contract requirements.
2. Approving contractor schedules, methods and procedures.

 **5**.**3.3 Schedules**

 The Resident Engineer must ensure that the Contractors maintain their activities on a predetermined schedule, in accordance with the Contract terms. The critical path method (CPM) is an effective technique in planning, scheduling and controlling construction projects. The Resident Engineer shall request a detailed schedule to be prepared by the Contractor at the beginning of the project. Work should not be allowed to commence until the schedule has been submitted and approved. The Contractor is responsible to maintain this schedule up-to-date at all times by updating progress on a monthly basis or whenever major project changes occur.

The Resident Engineer must at all times be aware of the status of construction progress vs. the contract schedule, and of delays and the steps being taken to get work back on schedule. Delays which will impact the Contract completion dates must immediately be brought to the attention of the Project Manager.

 **5.3.4 Stopping/Suspending Work**

 Stopping or suspending the Contractor’s activities is a serious matter, and the Resident Engineer must exercise the utmost care when dealing with this issue.

 The Resident Engineer can be expected to stop or suspend the Contractor’s operations in cases of illegal actions, safety violations or environmental hazards when the Contractor’s activities represent a “clear and present danger” to site personnel, the public, property or the environment, when the Contractor is in violation of Contract conditions or laws. In such cases, the MBTA Safety Department and the Environmental Compliance Group (if appropriate) and the Project Manager must be notified immediately. The Resident Engineer must remember that in the cases of injury, property damage or environmental contamination due to Contractor operations, the MBTA may be held liable, and part of the Resident Engineer’s role is to protect the MBTA’s interests at the site.

 Instructions to the Contractor to stop or suspend work for the reasons discussed above require, at the minimum, issuing an email and/or verbal direction to the Contractor’s site representative, clearly explaining the nature of the violation. This should be followed as soon as possible by a more formal notification, by letter, from the MBTA Project Manager to the Contractor’s Project Manager.

 In other cases (e.g., non-conformances such as improper work, defective materials, etc.), work should be stopped or suspended only under extraordinary situations, and then only as a “last resort” after careful consideration of all options. The Resident Engineer should document the non-conformance on a Resolution Report (See QAP 12.1, Problem Identification and Resolution Form), try to reconcile any problems with the Contractor as quickly as possible, while seeking input and guidance from the Project Manager regarding the stop work. The Resident Engineer must make it clear to the Contractor that non-conforming work may not be accepted may have to be replaced and/or corrected at the Contractor’s expense. The Resident Engineer should keep complete records regarding the situation in the project files, including any communications with the Contractor. If a stop work is issued the Contractor should be notified immediately via email/verbal direction as noted above.

**5.3.5 Meetings**

 At the beginning of the project, the Resident Engineer, in conjunction with the Project Manager, shall establish a schedule of project meetings with the Contractor. Project Meetings shall be held on a regular basis to review progress and other project related matters.

 The Project Office must be advised of all meetings attended by the Resident Engineer. The RE or his/her designee shall document and distribute the minutes of the meeting in accordance with Section 2 and a copy retained by the Resident Engineer for the project files.

 The Resident Engineer must take care not to commit the MBTA in any manner not previously authorized through proper channels within the MBTA. Tentative agreements reached at such meetings are subject to approval by the Project Manager, and it should be made clear to all parties that all such tentative agreements require confirmation. Copies of the minutes of any meetings where specification alterations are discussed and agreed upon, material changes made, and/or any item where specified material alternates are agreed upon, shall be forwarded for a formal submittal. Submittals shall be processed in accordance with Section 8. Changes to a drawing or specification should be documented on a Resolution Report (QAP-12.1) and processed through the review and approval cycle.

 Note that in the event any contract changes require additional funding the RE must follow MBTA Change Order Guidelines for proper authorization via AGM/GM/DIR

**5.3.6 Environmental Surveillance Checklist**

 Maintaining a safe and environmentally secure work site is a priority requirement for the MBTA field construction management team. To help ensure that the environment is not harmed or polluted by the actions of our Contractors, the MBTA requires that all Contractors obey all requirements of not only the MBTA Contract, but those of the U.S. and Massachusetts environmental statutes as well.

 Along with other items normally discussed during pre-bid and pre-construction conferences, the Contractors must be made aware of our commitment to enforcing environmental requirements, and that we will be conducting inspections of their activities. To assist the Resident Engineers in documenting surveillance and inspections, the Environmental Surveillance Checklist (Exhibit 5.1) should be used.

 Resident Engineers will ensure that Inspectors include environmental surveillance as part of their normal site duties. Resident Engineers will institute environmental inspection using as a minimum, Exhibit 5.1 at a frequency of not less that once per month for each site occupied by a Contractor. The Environmental Surveillance checklist should be discussed at progress meetings and documented in the meeting minutes. (Exhibit 5.1) A copy of the completed forms will be forwarded to the Contractor. For items where the Contractor is found deficient, work may be suspended and the non-conformance tracked through the use of a Resolution Report as required by QAP 12.1. Retainage of payment may be considered for items not corrected by the Contractor. Assistance from the Environmental Compliance Department is available to the Resident Engineers upon request.

**5.4 Procedure**

 **5.4.1 Conformance of the Work**

The Contractor’s work must satisfy the requirements of the Contract Drawings and Specifications. Any deviations from these Contract requirements (including, but not limited to materials installed, quantities installed, details used, workmanship and methods, dimensions and tolerance, etc.) requires advanced written approval from the MBTA.

If the materials used in the finished or in-process work do not satisfy the requirements of the Contract Documents, a Resolution Report shall be generated (See Reference QAP-12.1) and the situation immediately brought to the attention of the Project Manager, and possibly the Designer, depending on the non-conformance.

It is possible that the work may not satisfy the Contract requirements, but could still result in an “acceptable” product. In this case, the work could be accepted after evaluation and approval by the Designer and the MBTA via the Resolution Report. This may subsequently result in a Contract Change. Proper documentation is required of the change, including a detailed justification.

Alternatively, the work may not satisfy the Contract requirements and could be judged to be inadequate or inferior, and therefore unacceptable for inclusion in the project. In such a case, the disposition to the Resolution Report will require the Contractor to remedy the non-conformance at their own expense, either by replacement repair, modification or rework, depending on the nature of the non-conformance.

Non-conforming conditions must be documented on a Resolution Report and processed as required by QAP-12.1. Judgments as to the acceptability of non-conforming work will be recorded on the Resolution Report which requires the concurrence of the Project Manager, the Designer and the MBTA’s Quality Assurance Group. The situation should be dealt with quickly and decisively to minimize delays.

It is the responsibility of the Resident Engineer and Inspector(s) to ensure that all portions of the work are performed in accordance with the Contract Documents, using approved materials and methods.

 **5.4.2 Inspection of the Work**

 All materials used on a job and each part or detail of the work is subject to inspection by the Resident Engineer and the Inspectors. The Contractor must at all times provide the Resident Engineer and the Inspectors access to the work so that inspections can be performed. Likewise, the Resident Engineer must work closely with the Contractor to schedule inspections to ensure that the inspections are conducted in a reasonable and timely manner without unfairly delaying the progress of construction. The Inspectors shall plan, perform and document inspections in accordance with Section 6.

 **5.4.3 Time and Material Work included within Base Contract as an Allowance**

 It is extremely important to verify and record all information related to time and material work. This should include equipment, contractor personnel, time contractor spent on completing the work, reference to photographs taken, etc. A Time and Material Slip, Exhibit 5.2 shall be completed for all time and material work. The RE should assign an inspector to each time and material job. The Inspector should take pictures each day that time and material work is performed and assures that the contractor work conforms to contract requirements. The RE must assure all time and material charges are accurate. Inspectors shall use the Attribute sheet contained in Section 2 Field Inspectors Handbook, Time and Material attribute list.

 For Extra Work, the Resident Engineer is required to follow procedure provided in the MBTA Change Order Guidelines.

**5.5 Exhibit**

 **Exhibit 5.1 – Environmental Checklist**

**Exhibit 5.2 - Time and Material Slip**

**Exhibit 5.1**

**MASSACHUSETTS BAY TRANSPORTATION AUTHORITY**

**ENVIRONMENTAL SURVEILLANCE CHECKLIST**

Contractor: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Contract No.: \_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_

Site/Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |  |
| --- | --- | --- | --- |
| Item Checked: | Accept | Reject | N/A |
| 1. Erosion Control
2. Drainages to offsite areas controlled?
 |  |  |  |
| 1. Hay bales and/or silt fences functioning properly?
 |  |  |  |
| 1. Area disturbed minimized?
 |  |  |  |
| 1. Silt fences, sedimentation ponds, hay bales, construction entrances installed per drawing & specs?
 |  |  |  |
| 1. Areas seeded/restored per contract requirements?
 |  |  |  |
| 1. Dust Control/Air Quality:
2. Has the contractor implemented dust abatement measures to minimize/control the generation of dust at the site?
 |  |  |  |
| 1. Do construction equipment emissions comply with EPA standards?
 |  |  |  |
| 1. Noise:
2. Are noise generating equipment/procedures occurring within the acceptable time periods (i.e. 7:00 am – 6:00 pm)?
 |  |  |  |
| 1. Are personnel operating noise generating equipment wearing proper noise protection?
 |  |  |  |
| 1. Is the site being monitored to ensure that noise levels are within specification limits?
 |  |  |  |
| 1. Are the noise monitoring data within the acceptable range?
 |  |  |  |
| 1. Pollution Prevention:
2. Is waste properly stored, controlled, and disposed?
3. Are waste containers properly labeled?
4. Are drums/containers holding liquid hazardous waste/material stored on the bare soil?
5. Do drums/containers holding liquid hazardous waste/material have a secondary containment system?
6. Are hazardous waste accumulated and stored on site disposed of within the 90-days storage period?
7. Are contaminated soil piles stored on poly liners and covered when soil is not added or removed from the soil pile?

6 |  |  |  |
| 1. Are pesticides, cleaners, solvents, coatings, etc properly controlled, stored, and disposed of?
 |  |  |  |
| 1. Construction equipment properly maintained to prevent leaks?
 |  |  |  |
| 1. Is construction equipment parked in designated areas during off-shift or idle times?
 |  |  |  |
| 1. Is equipment refueling performed in such a manner as to minimize spills?
 |  |  |  |
| 1. Is fuel, hydraulic fluids, etc. properly stored and maintained and are containers properly marked?
 |  |  |  |
| 1. Are spills properly confined, reported, and cleaned?
 |  |  |  |
| 1. Waste Minimization

 a. Are attempts made to minimize waste?  |  |  |  |
|  b. Is waste properly handled, transported, and disposed of?(i) Is hazardous waste disposal occurring within the limits of on-site storage/ accumulation?(ii) Are manifest and hazardous waste bills of lading properly filled out and copies retained for records?  |  |  |  |
|  c. Is Contractor hauling waste to an approved site? |  |  |  |
| 6. Environmental Permits: a. Are all required permits issued and available for review? |  |  |  |
|  b. Is contractor complying with all permit requirements? |  |  |  |
| 7. Oil-Water Separator: a. Functioning properly? |  |  |  |
|  b. High level alarm hooked-up and functional? |  |  |  |
|  8. Other Comments/Deficiencies:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Inspected by: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

**Exhibit 5.2**

**MASSACHUSETTS BAY TRANSPORTATION AUTHORITY**

**DAILY REPORT**

**LABOR, MATERIAL & EQUIPMENT**

|  |  |
| --- | --- |
| Date: | Contract No: |
| Contractor: | Report No: |
| Important: This form must be submitted not later than the day following the date the work was performed | Page: Of: |

The following work was performed this date requiring use of the labor force, materials, equipment, special forces and services listed below:

|  |
| --- |
| Description of Work: |
|  |
|  |
| Certified Correct By: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Labor and Equipment |
| Name | Craft | Class | Hours | Description |
|  |  |  | STDOT |  |
|  |  |  | STDOT |  |
|  |  |  | STDOT |  |
|  |  |  | STDOT |  |
|  |  |  | STDOT |  |
|  |  |  | STDOT |  |
|  |  |  | STDOT |  |
|  |  |  | STDOT |  |
|  |  |  | STDOT |  |
|  |  |  | STDOT |  |

MATERIALS, SPECIAL FORCES AND SERVICES

|  |  |  |
| --- | --- | --- |
| QTY | UNIT | DESCRIPTION |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

For MBTA Use Only:

Hours Verified By: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Approved By:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 MBTA Inspector Resident Engineer

5

|  |  |
| --- | --- |
| **RESIDENT ENGINEER’S MANUAL** | **Section 6** |
| **TITLE**: Project Diaries | **Date:** 02/02/2012 |

**6.1 Purpose and Scope**

 To describe the requirements for completing Project and Inspector diaries.

**6.2 References**

Resident Engineer’s Procedure, Section 9, Monthly Pay Estimates

Quality Assurance Procedure, QAP-12.1, Problem Reporting and Resolution

 MBTA Daily Field Inspector Report

**6.3 General**

 **6.3.1** The Project and Inspector diaries are important tools that describe in narrative form, those events of the project that occur on a daily basis. Diaries may be used as reference documents or to settle disputes that may arise even after the project closes. As such it becomes important that the information contained within the diary is complete, clear, and accurate.

 **6.3.2 Responsibilities**

 **6.3.2.1** The Resident Engineer (RE) is responsible for maintaining accurate, detailed and up-to-date records.

 **6.3.2.2** Inspectors are responsible for inspecting and documenting results in Inspector Diaries and on appropriate Inspection Reports.

 **6.3.2.3** The RE is responsible for assuring that all diaries’ entries are made in strict adherence to this procedure.

 **6.3.3** In order to maintain proper financial control over the progress of the job, the project and inspector diaries are the primary source of information to justify payments. The diaries are used in conjunction with the records listed below which relate to payment functions, Section 1 - Role of Resident Engineer.

|  |
| --- |
| **TYPICAL PROJECT RECORDS** |
| TITLE | DESCRIPTION | USE |
| Project Diary | 8” x 11” Ruled Binder | To record daily events |
| Cost Control Ledger | 2 Post Binder or computer generated report | Maintain a running total of quantities |
| Manifold/Calculation sheets | Tear Out and Duplicate Pages | Maintain for quantities |
| Inspector Daily Diary | Hardbound Diary Book (numbered) | To record quality control, quantities and daily events |
| Office Calculation Book 2 Post Binder(Or File Folder System) | Calculation SheetSketch Sheet | Record all sections etc., to arrive at quantities in Cost Control Ledger – Concrete items, etc. |
| Survey Notebooks | Field Book | All Survey Data |
| Record Drawings | Mark-ups of full-size drawings, supplemental sketches | Track progress/quantities |
| Record of breakdown of Lump Sum Items | Loose Leaf/File Folders | Agreed percentage for breakdown of lump sum items |

**6.4 Procedure**

**6.4.1** Inspector Diaries – The Inspector Diary is the primary source of information for a MBTA construction project. Inspectors assigned to field operations will be furnished a book marked MBTA Daily Field Inspector Reports, which is to be used to record daily activities for Quality Control and daily quantities. Each Inspector shall submit a daily diary report covering all operations the Inspector was working on or responsible for during that day to the Resident Engineer. Inspector Diaries are available from the Quality Assurance Department.

 **6.4.2 Inspector Diary**

6.4.2.1The Inspector Diaries shall contain, where applicable, the following data:

1. Date, weather, temperature, weather and temperature should be recorded at the beginning and end of the shift.
2. Location, quantity and description of work.
3. Drawing number and specification section.
4. Station and offset from known base line.
5. Identity of structure, such as bridge number.
6. General location if no other method is available.
7. Quality Control – Slump Test, Compaction Test, etc., correction of non-compliance.
8. Reference to any Inspection Report or Resolution Report generated. Note: Unsatisfactory inspection results should be recorded on a Resolution Report in accordance with reference QAP-12.1 Resolution Report.
9. Any information pertinent to the item covered. This would include concrete cylinders made, air meter tests, compaction tests, samples taken, etc.

**6.4.2.2** The Inspector Diary Books will be maintained in the Project Field Office. Each Inspector will make daily entries sheets and submit them to the Resident Engineer to be kept on file after they are used in making out the Project Diary.

 **6.4.2.3** The Resident Engineer shall review the inspector diary slips to assure they contain the required information, are accurate and clearly written.

**6.4.3 Project Diaries**

 **6.4.3.1** The Resident Engineer shall prepare a diary for each project. The following format will be utilized inside the front cover of the Project Diary.

**6.4.3.2** The Inspector Diary shall be completed in its entirety daily. Please refer to the Daily Field Inspector Report.

 **TITLE PAGE**

Name of Project:

Year of Contract Award:

Station Limits: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Contract Number and Date:

Extension of Time:

Work Started – Date:

Contract Finish – Date:

Work Suspended – Date:

Work Resumed – Date:

Work Completed – Date:

Name of Resident Engineer(s):

Name of Contractor:

Name of Design Engineer & Control No.:

 **6.4.3.2** A “Standard” System of making entries into Project Diaries is outlined below:

 DATE: \_\_\_\_\_\_\_\_ DAY: \_\_\_\_\_\_\_\_\_ WEATHER: \_\_\_\_\_\_\_\_

 TEMP: \_\_\_\_\_ 8:00 A.M. \_\_\_\_\_ 12:00 Noon \_\_\_\_\_ 4:00 P.M.

1. Authority Personnel (Complete on Monday, note any changes during remainder of the week).
2. Survey Parties /Survey Activities (Complete on Monday, note any change during remainder of the week).
3. General Contractor’s Labor and Equipment Force (Complete on Monday, note any changes during remainder of the week).
4. General Contractor’s Progress (Operations Underway). Summarize Inspector Diary entries (reference specific entries as needed).

**4a.** Subcontractor’s Progress and Forces: Summarize Inspector Diary entries

(reference specific entries as needed).

1. Contact with MBTA Officials.

**5a.** Contact with Consultants.

**5b.** Contact with Federal Government Representatives

1. Contact/Meeting with Contractor
2. Contact or work done with Private and/or Public Utility Officials.
3. Contact with General Public
4. Materials (Progress and Record Samples – Special Tests)
5. Extra Work or Alterations
6. Claims
7. Right-of-Way Matters (Flaggers)
8. Accidents/Safety
9. Pictures
10. Traffic Officers

**15a.** Traffic Conditions – MBTA Operations and/or Pedestrian Detours, etc.

1. Miscellaneous

A sample Project Diary entry is included as Exhibit 6.1

**6.4.4** The foregoing numbering system will be used on all projects. The number system will be pasted in the front of the diary to be used as a check list. The Resident Engineer will insure that each Book used on the Project is listed, by name and number, on the inside cover of the Project Diary.

**6.4.5** Diary entries should be made in accordance with the above format and will be entered in ink by the Resident Engineer, or by his/her assistants in his/her absence. Activity numbers should not be shown on a day when it does not apply. The Resident Engineer shall adequately describe the activities and not be restricted by space on pre-numbered pages. In these instances the following pages shall be renumbered. The Resident Engineer will sign and date after the last entry for each report.

**6.4.6 Records**

 Project Diaries and Inspector Diary shall be maintained in secure file cabinets.

**6.5 Exhibits**

 **Exhibit 6.1 -** Sample Project Diary Daily Entry (See Exhibit 5.1

**Exhibit 6.1**

**SAMPLE PROJECT DIARY DAILY ENTRY**

 Oct. 28, 1994 – Monday Fair 8:00 a.m. 45 12 Noon 35 4:00 p.m. 31

1. C. E. Jones, on vacation A.T. Brown, on sick leave

 J. Smith B. Black G. Daley A. White C. Most

1. One Survey Party on job laying out and staking Ramp A.

 L. Dix (Chief); R. Lion (Trans.);

1. 1 Supt. 1 Carp. Foreman 1 Master Mechanic

 2 Asst.Supts. 10 Carpenters 6 Operators

 1 Timekeeper 2 Labor Foreman 4 Oilers

 1 Civil Engineer 24 Laborers 10 Truck Drivers

 3 Pump Operators 1 Welder

 2 Crawler Cranes 10 Trucks 2 Bulldozers

 9 Truck Cranes 9 Pumps

1. Excavating peak, 20+20 to 30+80 Lt., Center & Rt. of M.B.L.

 Excavating for roadways 50+00 to 55+25 Lt. and Rt. of M.B.L.

 Excavation being used for embankment 50+00 to 54+00.

 Placing borrow (from Brown’s Pit #1) for roadway 2+00 to 3+30 Ramp 35.

 Forming for West Abutment footing, South Street Bridge. Placing concrete in East

 Abutment footing, South Street Bridge. Excavating for and laying 18” RC Pipe from M.H.

 122+00 to M.H. 124+60, South Street relocated.

 **4a.** Camel Reinf. Co.: 1- Foreman, 2 – ironworkers

 Placing reinf. Steel in South Street Bridge Center pier columns.

1. Asst. Const. Engr. Robinson on job in a.m. to discuss Report of Change, providing for flattening slope in an area of deteriorated ledge, vicinity Sta. 33+0 to 37+0 Left. Formal Alteration to be prepared by Project Office to obtain required Board Approval. Went over job and discussed operations underway. Returned call to Boston office. Talked to Project Manager on job progress.

**5a**. Talked with J. Good of Consultants, Inc., regarding drainage on West St.

**5b.** Tom High, DOT was on job this a.m. Went over job and discussed operations

underway. He investigated and approved removal of dangerous ledge between Sta.

 33+00 to 37+00 Lt. Signed Form covering this change.

1. Informed Contractor’s Supt. Henry that I was not satisfied with borrow being used because it contains loam, etc., due to shovel excavating before proper topsoil stripping had been completed in pit. Also, informed him that no work can be started on pipe insulation until subcontractor is approved by MBTA.

Exhibit 6.1

1. Talked to E. Pink (Water Engineer) for City regarding proposed water shutdown of 12” L.S. on West St., that would be have to be made to connect relocated 12” line. Gas Co. dead-ending their six (6) inch line on South Street. Called T. Paul about Electric Co. poles that have to be moved back of proposed curb line on South St. Paul said crew will be on job tomorrow.
2. Mrs. Kane called complaining about Contractor’s trucks speeding on Black St. Informed her that this was a matter for local Police.
3. Submitted record samples of gravel and crushed stone to Authority Lab. (See laboratory report for locations). Personnel present when record samples were obtained: A.D. Levine, Res. Eng.; R.P. White, Consultant Mat. Engr.; and J. Thompson and R.J. Quinn, DOT.
4. Contractor working on E.W.O. #2. Removing brick garage, 9+12 Lt. M.B.L.

1 Crane; 1 Truck; 1 Foreman; 1 Operator; 1 Oiler; 1 Truck Driver

1. Contractor excavation peat 30+20 to 30+80 Lt., center and Rt. of M.B.L. Contractor feels this is extra work as typical section shows removal of unsuitable material to Elev. 101.00 approximately. Peat extends to about Elev. 90.00. Contractor is trucking out all peat below Elev. 100. One (1) dragline; 10 trucks; 1 foreman; 1 operator; 1 oiler; and 10 truck drivers @ 10 hours each removing peat from Elev. 100 to Elev. 90.
2. Only house left in way of project is at 122 East St. Notified Construction Engineer that Contractor would be held up if house is not out of way by November 15, 1994.
3. Received report from police that at 11:00 a.m. today; a car had driven into drainage ditch on South St. No personal injuries. Car owned and driven by Carl Mann, 100 South Street, City (Mass. Reg. W11-222)
4. Authority photographer on job in p.m. Took pictures of fill condition at 1+00 to 1+50, N.W. Ramp to Bridge St.
5. Opened West St. detour road to traffic today.

 Signed: \_\_\_\_\_John Smith, Resident Engineer\_\_\_\_ \_\_

 Date:

|  |  |
| --- | --- |
| **RESIDENT ENGINEER’S MANUAL** | Section 7 |
| **TITLE**: Contract Changes | **Date:** 05/04/12 |

**7.1 Purpose and Scope**

To describe the requirements for the preparation, review and approval of Contract Change.

**7.2 References**

Project Manager’s Manual, Section 9, Construction

 MBTA Change Order Guidelines

 QAP 12.1, Problems Identification and Resolution

**7.3 General**

Oftentimes, conditions encountered in the field differ from those anticipated during the design stage and preparation of Contract Documents. Quantities may differ from those included in the Contract or the materials and designs may not prove appropriate for the site conditions encountered. The Contractor, Designer or the MBTA may propose changes to the project after the Contract is in place (whether in terms of materials, design, schedule or scope) which benefits the Authority. Those changes generally require a change in the Contract Documents. All changes to the contract shall be processed in accordance with this procedure and Sections 1, 2, and 3.

**7.3.1 Definitions**

1. Change Order – A document executed by the MBTA and issued to the Contractor which amends the Contract.
2. Extra Work – Work which is not included in the Contract as awarded, but found to be necessary for the satisfactory completion of the Contract within its intended scope, and bears a reasonable “Subsidiary” relation to the full execution of the work originally described in the Contract.
3. Extra Work Order Letter (EWOL)– An order, in writing by the MBTA to the Contractor prior to performing the Extra Work, which defines the extra work to be done, and the basis of payments and time adjustments (if any). An Extra Work Order is signed by the person at the MBTA with proper contracting authority; however, the EWOL does not amend the contract and must be followed by the issuance of a Change Order.

**7.3.2 Responsibilities**

 **The Resident Engineer is responsible for:**

* 1. Assuring that any Change Order is fully justified and supported as required by MBTA Change Order Guidelines.
	2. Developing and processing Contract Change Orders and Extra Work Orders Letters.

 **The Project Manager is responsible for:**

1. Concurring in the need for all contract orders.
2. Assuring that all Contract Change Orders are justified, including what benefit the Authority will receive if the change is approved.
3. Assuring that the Contract Change Orders and EWOL are approved by the appropriate level of contracting Authority.

 **7.3.3 Change Orders**

The most common reasons for requiring a Change Order are overruns of unit price Pay Items and for Extra Work. If there is a condition that results in a substantial increase in the quantity required to do the work, the Resident Engineer is required to report this to the Project Manager and initiate a Change Order. Unit Price Pay Items that exceed 75% of the bid quantity should be reviewed by the RE, the Designer, and the Contractor. If it is determined that additional quantities are required to complete the work, an EWOL and/or Change Order should be processed before the bid units have expired.

 The following are typical situations that require the preparation of a Change Order:

* Overruns in quantities compared to the contract amounts or in allowance items.
* Change in design including (a) minor changes and (b) major changes requiring an Alteration.
* Extra Work Orders Letters (EWOL) (see para. 7.4.2)
* Changes in Specifications, for example (a) alteration, enlargement, etc., of specification and (b) substituting one product for another.
* Deviations in construction procedures.
* Deviations in any special provision requirement.
* Any other subject which the Project Manager might deem important.

**7.4 Procedure**

**7.4.1** When there is a potential condition which may require a Change Order, the Resident Engineer shall perform an investigation to determine the nature of the change and the consequences to the Project. The RE shall determine if the condition requires the issuance of a Change Order or an EWOL. Careful checking by the Resident Engineer of the actual conditions as encountered in the field against the plans should reveal the necessity for a change order or extra work order. It is extremely important for the RE to provide a complete justification for the change order or extra work order, including the benefits to the MBTA. The Resident Engineer shall inform the contractor that any work on the proposed change, prior to the approval of the change order is at the contractors’ risk.

**7.4.2 Extra Work** – If the condition found results in the need for extra work, the RE shall notify the Project Manager and Contract Administration and prepare an Extra Work Order request and/or Change Order in accordance with MBTA Change Order Guidelines.

**7.4.3 Endorsements**:After origination by the Resident Engineer, the Project Manager will assume responsibility for additional approvals and processing as required in accordance with above.

**7.5 Exhibits**

None

|  |  |
| --- | --- |
| **RESIDENT ENGINEER’S MANUAL** | **No.** Section 8 |
| **TITLE**: Submittals | **Date:** 05/04/12 |

**8.1 Purpose and Scope**

 To describe the methods used to receive, process and approve submittals.

**8.2 References**

 MBTA Change Order Guidelines

 Specification Section 01300 - Submittals

 Consultant Standard Construction Phase Services Scope of Work

 Specification Section 01321 - Construction Schedule

 PM Manual Section 5.5.1 - List of Departments.

**8.3 General**

 **8.3.1 Definitions**

Shop Drawings: Original drawings, submitted to the Engineer by the Contractor pursuant to the Work, including, but not limited to: stress sheets, working drawings, diagrams, illustrations, schedules, performance charts, brochures, erection plans, falsework plans, cofferdam plans, bending diagrams for reinforcing steel, or other supplementary plans or similar data which are prepared by the Contractor or a Subcontractor, manufacturer, supplier, or distributor, and which the Contractor is required to submit for review and approval by the Engineer.

Working Drawings: Contractor prepared plans for temporary structures and facilities. Working Drawings for elements of work which may affect safety of persons or property including but are not limited to Contractor’s plans for temporary structures such as decking, temporary bulkheads, support of utilities, and for such other work as may be required for construction but which do not become an integral part of completed project.

Miscellaneous Submittals: Those submittals directly related to the work (non-administrative) including quality assurance program, resume of QA Managers, warranties, guarantees, maintenance agreements, maintenance of traffic plan, project photographs, survey data and reports, physical work records, quality testing and certifying reports, record and as-built drawings and data, operating and maintenance manuals, security and protection lists (including keying) and other similar information and materials not defined as shop drawings, working drawings, product data, sample mockups or sample panels.

 **8.3.2 Responsibilities**

The Resident Engineer (RE) is responsible for:

1. Developing or obtaining, within 2 weeks of the Notice to Proceed, a log of submittals for the project. A sample log is provided in PM Manual 5.5.1. The log shall uniquely identify each submittal and include measures to track each submittal by date through the progression of the review cycle and its ultimate disposition. If the RE delegates the responsibility to develop and/or maintain the log to the Designer, up to date copies of the Designer’s log should be obtained on a regular basis. In either case, all parties should use the same identification system for identifying and tracking the submittals. Any delegation of the responsibility shall be in writing and include adequate instructions on the details of the tracking system.
2. Developing a list of reviewers for submittals. Reviewers shall be listed as having primary or secondary review responsibility for all submittals. PM Manual 5.5.1 shall be used as a guide only for these reviews. Additional reviewers shall be added as necessary. The Log should be routed to the various MBTA departments for identification of those submittals they wish to review.
3. Assuring that the Contractor submits all required documentation
4. Coordinating process and distribution of submittals for review and approval. This process shall be developed during the pre-construction meeting.

**8.3.3 Subcontractor Approval**

 All submittals by the Contractor for approval of Subcontractors are to be accompanied with a completed Sub-Contractor Approval Request (Exhibit 8.1). The Director of Quality Assurance shall approve these submittals after review and approval by the Designer, Project Manager and reviewers.

 Until a subcontractor is approved, the subcontractor shall not be allowed to perform work on the project.

There are standard Subcontractor Approval Forms supplied by the MBTA Project Office to the General Contractor that are to be submitted and accompanied by the standard Submittal Cover Letter. These Subcontractor Approval Forms must be completed prior to the Subcontractor starting any work. Forms are designated as Form A – Subcontractors Work History and Form B – Subcontractors EEO Submittals (Exhibit 8.1) These forms are to be used for all future evaluations of Subcontractor submittals for acceptance. Assistance in completing Form B can be obtained from the EEO Compliance Officer assigned to each project.

**8.3.4 Sources of Materials**

 A report on the sources of materials should be obtained from the Contractor as soon as possible after work starts so that the Authority’s Materials Testing Engineer or Designee may sample the material before its arrival on site. Follow the first reports with supplementary reports until all materials have been covered. In case of a change of the source of any materials, submit another report with a note: “this change of the source is to be used instead of (or in addition to) that given on Submittal Number \_\_\_\_.”

**8.3.5 Certificate of Compliance for Materials and Buy America Requirements**

 The RE shall assure that Certificates of Compliance (C of C) for Buy America requirements and materials have been received. In certain instances the RE may elect to forward some C of C’s to the Designer and the Authority’s Materials Testing Engineer for review/approval. Upon approval, retain copies for the project files.

**8.3.6 Vendors/Plant Inspected Materials**

 For those vendors providing materials to be used on a project which will be inspects at plants before shipment (e.g. precast concrete rail ties, structural steel, galvanizing operations, etc.), follow the procedures for Sources of Materials above. The Materials Testing Engineer should be provided with as much advanced notice as possible in order to arrange for the plant inspections prior to shipment of the materials.

**8.4 Procedure**

**8.4.1** The RE or designee shall maintain a log of all submittals for the project. The log should be maintained up-to date and accurately describe the submittal and where it is in the approval cycle, including dates of actions taken and final disposition of the submittal. The log should be developed at the beginning of the project in conjunction with the Designer. The submittals should have a targeted submittal date which is sufficiently in advance of construction to allow for a proper review and approval cycle.

**8.4.2** As submittals are received from the Contractor, the RE or designee shall log the submittal, then forward it to the reviewers.

**8.4.3** The RE or Designee shall process the submittal through the review and approval cycle. The RE or Designee shall assure that the reviewers provide comments back within the required time. When comments have been returned, the RE or Designee shall resolve all comments and provide a final disposition to the submittal. If the Designee provides the final disposition then the Designee shall forward to the RE for distribution to Contractor.

**8.4.4** If the submittal is not approved, the Contractor shall be informed for the reasons. If re submittal is required the RE shall inform the Contractor. The resubmittal shall reference the original submittal number. The Resident Engineer should assure that the Contractor does not proceed with construction until the submittal has been approved.

**8.4.5 Changes**

 Any changes to materials or the contract requirements require a formal submittal by the Contractor. The submittal shall be clearly marked as a change from contract requirements and reference any previously approved submittal. Any request for a change in previously approved materials or methods must be accompanied by a complete justification for the change, including the cost and schedule benefits(s) to the MBTA. Note: if there is no benefit to the MBTA to make the change, then the request should normally be denied by the RE. If there is a cost increase to the project, a change order must be processed and approved prior to the submittal being approved in accordance with the MBTA Change Order Guidelines.

**8.4.6 Records**

 Copies of all submittals are to be maintained by the RE in the project files.

**8.5 Exhibits**

 **Exhibit 8.1 - Subcontractor Approval Form A, Subcontractor – Work History**

**Exhibit 8.2 - Subcontractor Approval Form B, Subcontractor – E.E.O. Submittal**

**Exhibit 8.3 - Sample Submittal Log**

**Exhibit 8.1**

**SUB-CONTRACTOR APPROVAL REQUEST**

**Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Contract No. \_\_\_\_\_\_\_\_\_\_\_\_\_**

**Contract Title: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Sub-Contractor Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Address: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

 **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Phone No.: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Project Superintendent: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Specification Section and Scope of Work : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Estimated Contract Value: $ \_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Form A – Work History Attached \_\_\_\_\_\_**

**--------------------------------**

**MBTA Project Manager**

**MBTA Review:**

**\_\_\_\_\_ Approved \_\_\_\_\_ Not Approved**

**------------------------------------------ ------------------**

**MBTA Director QA/QC Date**

**Reason for Disapproval: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

FORM A

**SUBCONTRACTOR WORK HISTORY**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Date Project Completed****(Month/Year)** | **Project Title/Location** **(City, State)** | **Contract Value****($)** | **Description of Work** | **Client Name/Phone Number** |
|  |  |  |  |  |
|  |  |  |  |  |
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# Sub-Contractor Approval Request Instructions

1. The general contractor shall submit to the MBTA Project Manager the required sub-contractor information including general company information, and a completed Form A Work History. All blanks on page 1 of the request need to be completed.
2. The Form A Work History should include a minimum of five (5) completed projects finished within the last ten (10) years. The completed projects listed in Form A should be relevant to the proposed work, and the project information should be complete and accurate. An attached sub-contractor work history log that includes all the required information is an acceptable alternative to completing the Form A – Work History attachment.
3. The MBTA Project Manager completes the top section of the Sub-Contractor Approval Request based on information provided by the general contractor. Only first tier sub-contractors including plumbers, electricians, painters etc. must be submitted for approval. The MBTA QA/QC Lab should be contacted if there are any questions on which sub-contractors should be submitted for approval.
4. All sub-contractor approval requests should be submitted to the MBTA QA/QC Lab a minimum of one week prior to the sub-contractor starting work.
5. The MBTA Project Manager shall review the contractor/sub-contractor approval information prior to submission.
6. The MBTA QA/QC Lab will review the request and forward a decision to the MBTA Project Manager. If the request is not approved, the general contractor shall make the necessary corrections and re-submit for approval.



|  |  |
| --- | --- |
| **RESIDENT ENGINEER’S PROCEDURE** | **Section 9** |
| **TITLE**: Monthly Pay Estimates | **Date:** 05/04/12 |

**9.1 Purpose and Scope**

 To describe the requirements for processing and verifying monthly pay estimates.

**9.2 References**

 **2.1** Resident Engineer’s Procedure, Section 6, Project Diaries

 **2.2** Specification Section 01150 Measurement and Payment

 **2.3** Specification Section 01321 Schedules

**9.3 General**

 **9.3.1 Responsibilities**

 **The Resident Engineer is responsible for:**

1. Verifying quantities, dollar value and percent complete progress of scheduled activities prior to processing pay estimate.
2. Maintaining detailed and up-to-date records.
3. Preparing and submitting a contractor’s performance rating sheet every sixth estimate.

 **The Project Manager is responsible for:**

1. Approving Monthly Pay Estimates.
2. Assuring that estimated listing items do not exceed 100% of the contract quantity. A Change Order is required for items that exceed 100% of the base contract.
3. Periodically investigating the job records of projects within the Project Manager’s jurisdiction to determine if the records are clear, complete and up-to-date at all times.
4. Approving the 6-month Contractor Performance evaluation.

**The Inspectors are responsible for:**

1. Verifying quantities, dollar values and percent complete progress of scheduled activities prior to processing pay estimate.
2. Compile backup required to support pay estimates

**9.3.2 Quantities for Pay Estimates**

For unit price contracts, all quantities on pay estimates must be properly documented. No quantities are to be submitted without evidence to substantiate that the work has been performed. Any measurement made or quantities computed must be signed and dated by the individual verifying the work so there will be no question on the responsibility for the reported quantities.

For Lump Sum contracts, all payments must be verified using actual project progress against the project schedule.

 **9.3.3 Monthly Pay Estimates**

 **9.3.3.1** Monthly Pay Estimates will be based on:

1. Clear, complete manifold/calculation sheets.

B. Complete and detailed back-up for these reports.

C. Accurate, up-to-date Project and Inspector Diaries (See Section 6).

D. Calculation of quantities as soon as possible as the work progresses and calculable portions are completed.

E. Calculation of percent complete

The use of the above criteria will result in an accurate, up-to-date pay estimate at all times and facilitate the preparation of final job records upon completion of the work.

**9.3.3.2** The Resident Engineer should carefully analyze the work performed in preparing the Monthly Pay Estimates to ensure that no overpayment is made. No work item quantity which exceeds 100% of the contract quantity shall be processed for payment. A change order must be processed if additional quantities are required.

**9.3.3.3** The Authority shall retain 5 percent of all estimates until 50 percent of the work has been completed as part security for fulfillment of the contract by the Contractor. Section 01150, Article 1.07 (Measurement and Payment) of the MBTA Division 1 – General Requirements will govern the partial payment.

**9.3.3.4** To avoid complaints by Contractors, it is required that the estimates represent a fair appraisal for the work performed.

**9.3.3.5** The Resident Engineer and Contractor’s representative shall work together in reviewing work performed since the last estimate, and agree on all quantities, activity percent complete and payments to be made on the present monthly Pay Estimate.

**9.3.4 Guide For Entering Pay Quantities on Skeletons and Estimates**

* Unit Price Items. Pay each L.F., C.Y. S.Y. (etc) unit. It is possible to pay part of one whole unit with a decimal brought out to two places (e.g., 0.23). Unit Price items may not overrun the preliminary quantity.
* Lump Sums. These can be paid by either the dollar value, or a percent of the lump sum based on the schedule of values. Lump sums cannot be overrun or underrun. If there is a change in scope (positive or negative) a Change Order must be processed.
* Allowance Items. Allowance items are always paid in decimals, to the nearest second decimal point under the amount the Contractor has requested by submittal of paid invoices and approved backup. Allowance items may not be overrun.
* A running total of amounts paid and amounts billed should be kept in a Pay Item File for each item. At the end of the Contract a Contract Quantity Variance (CQV) shall be processed.

 **9.3.5 Cost Control Ledger**

A computerized ledger report shall be used to record the cumulative quantity of work on each item. The Cost Control Ledger shall include data depicted in Exhibit 9.1. The following requirements will be strictly enforced:

* Quantities will be entered on a regular basis.
* Quantities will be computed and/or obtained from the Inspector Diary/Calculation sheets, cross-section sheets or plans and sketches drawn for special items of work.

**9.3.6** **Record Plans and Cross-Sections**

 One set of full scale plans is to be kept in the field office at all times and are to be designated as the “Record Plan” and Cross-Sections for the project. The progress and computation of quantities for certain items such as clearing and grubbing areas, grading, compacting and finishing areas, seeding areas, etc., can best be kept on record plans. Peat excavation and loam excavation items should be plotted on construction cross-sections and on record plans showing outline of areas completed. Ledge sections should be plotted every 25 feet unless very irregular ledge is encountered. When irregular ledge sections are encountered, sections should be taken as often as necessary to obtain reasonably accurate quantities. Ledge quantities for intermediate estimated may be plotted every 50 feet on the blue sections. Sections, record plans, and quantities should be kept up-to-date from information obtained from the diaries.

Progress and record plans for such other items as drainage lines, water lines, road surface areas, sidewalk areas, curbing, etc., should be kept-up-to-date. All record plans showing work that is underground must be kept up-to-date.

 **9.3.7 Contractor Performance Evaluation**

 The Resident Engineer shall assist the Project Manager in completing the Contractor Performance Rating Sheet (Exhibit 9.2) every sixth payment.

**9.4 Procedure**

**9.4.1** Each month the Contractor will submit an estimate for payment of work. The Contractor must also submit a Cash Drawdown Projection Table (exhibit 9.3) reflecting how the dollar value of the “Contract Award” will be distributed over the term of the Contract. Subsequent Cash Drawdown Projection Tables will show the actual amount paid for the pay period. The Contractor must also submit an authorization letter stating who within the Contractor’s organization is authorized to sign estimates and Change Orders. This letter is required for the first estimate only.

**9.4.2** When the Contractor submits an estimate for payment of work, the Resident Engineer shall originate a Work Sheet, (Exhibit 9.4) listing all line items to be paid in numerical order. The Resident Engineer shall request a skeleton report from the Project Office. The RE shall then assign each line item to the appropriate inspectors for verification.

**9.4.3** The inspectors shall verify the quantities submitted for payment. Detailed calculations shall be prepared for each item. A manifold/calculation sheet (Exhibit 9.5) shall be prepared. Exhibit 9.5 shall be filled out in detail and list each date that quantities were installed and the amount installed on that day. Reference shall also be made to each Inspector’s Diary page number when the item was installed and accepted by the Inspector. When the quantity has been verified, Exhibit 9.5 shall be returned to the RE.

**9.4.4** If there are any discrepancies between the verified quantities and the Contractor submitted quantities the RE shall resolve the issue with the Contractor. Once all quantities are agreed upon, the RE shall sign the Manifold/Calculation sheet, transfer all pay quantities from the work sheet to the skeleton, then process the Skeleton Report to the Project Office.

**9.4.5** The Resident Engineer’s name, telephone number, contract dollar value to be paid, and percentage of retainage held this pay estimate, shall be placed at the top of the skeleton.

**9.4.6** The RE shall submit the skeleton and work sheet to the Project Office for entering into the CMS system and processing of the Pay Estimate. Note: If the Project is substantially complete and has been opened to the public by order of the Authority, a semifinal estimate may be requested from the Project Office.

**9.4.7** Upon receipt of two copies of the Pay Estimate, and one copy of an Accounts Payable Voucher, the Resident Engineer shall sign and shall have the Contractor sign both estimate copies. The RE shall attach the following information to the two copies of the Monthly Estimate:

**A.** The completed Work Sheet (Exhibit 9.4).

**B.** The Skeleton Report.

**C**. A signed DBE/WBE/MBE Form (Exhibit 9.6)

**D.** Accounts Payable Voucher.

**E**. A signed Resident Engineer’s Status Report (Exhibit 9.7).

**F.** A completed Construction Progress Monitoring Report (Exhibit 9.8) for the signature of the Project Manager.

**G.** A Contractor Authorization letter (first payment only). The Contractor must submit a letter stating who is authorized to sign the pay estimates and Change Orders on their behalf.

H. Two memoranda are required in the event retainage is stopped, reduced, or released: one from the Contractor requesting retainage and one from the PM approving release. (Retainage in the amount of 1% of the adjusted contract value must be held until contract close-out.)

**H.** Copy of Backup Documentation for the allowance and lump sum included in the pay estimate.

**9.4.8** The complete package shall be submitted to the Project Office for approval by the Project Manager.

**9.4.9 Final Pay Estimates**

Final pay estimates are prepared and processed according to the same procedures as the monthly pay estimates, except that certain additional documents must be prepared and accompany the final pay estimate.

 The additional documents used to close out a Contract in conjunction with the final pay estimate follow. These forms are available in the Capital Management System (CMS).:

* Construction Contract Closeout Report
* Certification for Substantial Completion (Form 6)
* Notification – Opening Portions of Contract for Operation (Form 7)
* Certificate of Completion and Release (Form 8)
* Certificate of Inspection and Acceptance (Form 9)
* Certificate of Occupancy (if applicable)

**9.4.10 Cost Control Ledger**

When the Pay Estimate has been approved by the Project Manager and all signatures have been obtained, the RE shall enter the paid amounts into the Cost Control Ledger.

Items which are paid for by material delivery slips (such as crushed stone for base course and ballast) shall be entered in the Cost Control Ledger. All weight slips must be **countersigned** by the Engineer or Inspector assigned to the operation.

**9.4.11 Records**

 The RE shall maintain complete and up-to-date files containing the above records. These records must be kept up-to-date so that a final or semifinal estimate can be prepared within a short period of time immediately after acceptance of the project, or after the declaration that the project is substantially completed and opened to the public use, whichever the case may be.

**9.5 Exhibits**

**Exhibit 9.1 - Cost Control Ledger**

**Exhibit 9.3 - Cash Drawdown Letter**

**Exhibit 9.4 – Pay Estimate Work Sheet (Both Lump Sum and Unit Price)**

**Exhibit 9.5 - Manifold/Calculation sheet**

**Exhibit 9.6 - DBE/WBE/MBE Form**

**Exhibit 9.7 - Resident Engineer’s Status Report**

**Exhibit 9.8 - Construction Progress Monitoring Report**

**Exhibit 9.2 - Contractor Performance Record**

**EXHIBIT 9.1**

**COST CONTROL LEDGER SHEET**

**CONTRACT No. XXCNXX EST. QUANTITY: 8 OVERRUN**

ITEM No. 0255.318 EST. AMOUNT: $16,000.00

ITEM DESCRIPTION: CATCHBASIN FINAL QUANTITY: UNDERRUN

CONTRACT No. $2,000.00 ea. FINAL AMOUNT:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Manifold Entry | Location or Description | Quantity | Quantity for Payment | Amount | Estimate | Remarks |
| Book-Page | Date | Insp. | Daily | To Date | This Est. | To Date | Date | No. |
| 1705-10 | 6/30/94 | Smith | No.’s 1-3Sta.’s 1 + 50, 2 + 24 | 3 | 3 | 3 | 6,000.00 | 6,000.00 | 7/21/94 | 13 |  |
| 1705-23 | 7/31/94 | Smith | No’s 7, 8Sta. 4 + 45 | 2 | 5 | 2 | 4,000.00 | 10,000.00 | 8/24/94 | 14 |  |
| 1704-4 | 9/30/94 | Smith | No. 6Sta. 3 + 85 | 1 | 6 | 1 | 2,000.00 | 12,000.00 | 10/21/94 | 16 |  |
| 1706-31 | 11/30/94 | Smith | No.’s 4, 5Sta. 3 + 02 | 2 | 8 | 2 | 4,000.00 | 16,000.00 | 12/20/94 | 18 |  |

**EXHIBIT 9.2**

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY

CONTRACTOR PERFORMANCE RECORD

CONTRACTOR: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ DATE:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

ADDRESS: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ MBTA CONTRACT NO.:\_\_\_\_\_\_\_\_\_\_\_\_

AWARD AMOUNT: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ADJUSTED VALUE:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

PERCENT OF PROJECT COMPLETION TO DATE: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

PERCENT OF WORK PERFORMED BY PRIME CONTRACTOR: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

INTERIM REPORT NO.: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ FINAL REPORT: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

EVALUATION PERIOD:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The Contractor Performance Evaluation is required to be submitted twice each year for the duration of the construction contract and upon contract closeout.

Rating: (100 Points Maximum)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Unacceptable -0 Points | Poor –2 Points | Satisfactory -5 Points | Very Good –8 Points | Excellent –10 Points |

1. Adherence to MBTA Safety Requirements: Rate this contractor’s safety and housekeeping procedures on this project. Were there any OSHA violations or serious safety accidents? Was there a culture of safety on this project? If so, provide specific examples.

Points: \_\_\_\_\_\_\_\_\_

Comments:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Rate the overall quality of this contractor’s workmanship. Were there quality-related or workmanship problems on the contract? Was there a culture of quality on this project: Please provide specific examples: Points: \_\_\_\_\_\_\_\_\_

Comments:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Resolution of Construction Deficiencies: Rate the contractor’s ability to resolve quality issues. Did the contractor correct problems on their own or did they resist until forced? Did the contractor proactively propose solutions?

 Points: \_\_\_\_\_\_\_\_\_

Comments:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Project Management: Rate this contractor’s performance with regard to adhering to contract schedules and milestones. Did the contractor regularly submit good quality schedule updates? Did the contractor meet the contract schedule or the schedule as revised by approved change orders? If not, was the delay attributable to this contractor? If so, provide specific examples. Points: \_\_\_\_\_\_\_\_\_

Comments:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Subcontractor Management: Rate this contractor’s ability, effort and success in managing and coordinating subcontractors (if no subcontractors, rate this contractor’s overall project management). Was this contractor able to effectively resolve problems? If not, provide specific examples.

 Points: \_\_\_\_\_\_\_\_\_

Comments:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Change Orders: Was the contractor reasonable to work with on identifying and resolving change orders or claims? Were this contractor’s prices on change orders and extras reasonable? If not, provide specific examples. Points: \_\_\_\_\_\_\_\_\_

Comments:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Paperwork Processing: Rate this contractor’s performance in completing and submitting required project paperwork (i.e. change orders, submittals, drawings, requisitions, payroll, workforce reports, etc.). Did the contractor submit the required paperwork promptly and in proper form? If not provide specific examples.

Points: \_\_\_\_\_\_\_\_\_

Comments:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Working Relationships: Rate this contractor’s working relationships with other parties (i.e. owner, designer, subcontractor, third parties such as municipalities or utility companies, etc.). Did this contractor relate to other parties in a professional manner? If not, give specific examples.

 Points: \_\_\_\_\_\_\_\_\_

Comments:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. On-Site Supervisory Personnel Rating Rate the general performance of the contractor’s on-site supervisory personnel. Did the superintendent(s) have the knowledge, management skills and experience to run a project of the size and scope? If not, provide specific examples.

Points: \_\_\_\_\_\_\_\_\_

Comments:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. General Performance: INTERIM REPORT: Is the contractor resolving open issues in a reasonable manner such that future closeout will be efficient.

FINAL REPORTING ONLY: Efficiency in Closing Out Project: Were as-built plans accurate and provided promptly at the end of project? Were they responsive to completing punch list items?

 Points: \_\_\_\_\_\_\_\_\_

Comments\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

TOTAL RATING:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Signature: Date:

Contractor: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Comments:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Signature: Date:

MBTA Project Manager \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

MBTA Director \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

MBTA Director of Quality Assurance \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

MBTA Chief Engineer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

MBTA AGM for Design and Construction\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 **EXHIBIT 9.3**

**CASH DRAWDOWN - PROJECTED**

Project No.: Estimator: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_

Estimate No.: \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_ Type of Work: \_\_\_\_\_\_\_\_\_\_

Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

CASH FLOW

|  |  |  |
| --- | --- | --- |
| Estimate No. | Value This Estimate | Value to Date |
| 1. |  |  |
| 2. |  |  |
| 3. |  |  |
| 4. |  |  |
| 5. |  |  |
| 6. |  |  |
| 7. |  |  |
| 8. |  |  |
| 9. |  |  |
| 10. |  |  |
| Total: |  |  |

**Exhibit 9.4**

**PAY ESTIMATE WORK SHEET**

Contract No. \_\_\_\_\_\_ Estimate No. \_\_\_\_\_\_\_\_\_\_ Period Ending \_\_\_\_\_\_\_\_\_\_ Sheet Number \_\_\_\_\_\_\_\_\_\_ of \_\_\_\_\_\_\_\_\_\_

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Number | Description | Contract Quantity | Unit | Pay This Estimate | Unit Price | Pay This Amount | Quantity | Remaining Quantity |
|  |  |  |  |  |  |  |  |  |
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Pay This Amount Total \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**EXHIBIT 9.5**

**MASSACHUSETTS BAY TRANSPORTATION AUTHORITY**

MANIFOLD/CALCULATION SHEET

Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Contract No. \_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_

Item No. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Description: \_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

SKETCH

CALCULATIONS

|  |  |  |
| --- | --- | --- |
| DIARY REFERENCES(Each day work performed) | INSPECTOR(Signature) | QTY |
| Pg(s) |  |  |
| Pg(s) |  |  |
| Pg(s) |  |  |
| Pg(s) |  |  |
| Pg(s) |  |  |
| **Total** |  |

Resident Engineer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Contractor Rep. \_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_

 **EXHIBIT 9.6**

**STATEMENT OF ESTIMATED VALUE OF WORK**

**BY DBE/WBE SUBCONTRACTORS**

 PROJECT:

 GENERAL CONTRACTOR:

 BASE CONTRACT AWARD AMOUNT:

 PAYMENT ESTIMATE NO.: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_ DATE: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 TOTAL CONTRACT AMOUNT PAID THIS ESTIMATE: $ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 TOTAL INITIAL CONTRACT AWARD AMOUNT PAID THIS ESTIMATE: $ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |  |
| --- | --- | --- | --- |
| DBE/WBE SUBCONTRACTOR | TRADE | SUBCONTRACTOR AWARD AMOUNT | SUBCONTRACT AWARD AMOUNT PAID |
| THIS ESTIMATE | PREVIOUSLY | TOTAL |
|  |  |  |  |  |  |
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SIGNED: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_ DATE: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 AUTHORIZED REPRESENTATIVE

 OF GENERAL CONTRACTOR

**EXHIBIT 9.7**



|  |  |
| --- | --- |
| **RESIDENT ENGINEER’S PROCEDURE** | Section 10 |
| **TITLE**: JOB CLOSEOUT | **Date:** 05/04/12 |

**10.1 Purpose and Scope**

 To establish the requirements and actions required to closeout a project.

**10.2 References:**

 **2.1** Resident Engineer’s Procedure, Section 3, Filing System Records

 **2.2** Project Manager’s Manual, Section 10, Closeout

**2.3** MBTA Standard Specifications, Division 1, General Requirements, Article 3.11, Final Acceptance

 **2.4** Resident Engineer’s procedure, Section 9, Monthly Pay Estimates

**10.3** **General**

 **10.3.1 Definitions**

**10.3.1.1 Substantial Completion** –The work required by the Contract has been completed except for work having a Contract price of less than one percent of the then adjusted total Contract price, substantially all of the work has been completed and opened to public use except for minor incomplete or unsatisfactory work items that do not materially impair the usefulness of the work required by the Contract (Exhibit 10.1).

**10.3.1.2 Pre-Final Estimates –** The estimate, prepared after the project has been substantially completed and opened to public use by order of the Authority, but before the final estimate.

**10.3.1.3 Pre-Final Inspections** – The inspections performed by the Contractor, Consultant, MBTA representatives, and other concerned parties after the Contractor has stated that the project is “substantially complete.” The inspection is performed to determine if the project is in fact “Substantially Complete.”

**10.3.1.4 Punch List** – A list prepared by the MBTA which identifies those items that either have not been completed by the Contractor or do not meet the Contract requirements. The Punch list is used to track the items to completion and final acceptance by the MBTA.

**10.3.1.5 Final Inspection** – The final inspection performed after all “Punch List” items have been completed or corrected to meet Contract requirements.

**10.3.2 Responsibilities**

The **Project Manager** is responsible for:

* Approving the scheduling of the pre-final and final inspections
* Informing the Contractor, in writing, of the results of the pre-final inspection and final inspections.

The **Resident Engineer** is responsible for:

* Assigning someone the responsibility to prepare the punch list.

 Note: The consultant is normally assigned the responsibility to prepare the (Punch) list of outstanding Work items.

* Preparing the pre-final and final estimates
* Scheduling the pre-final and final inspections
* Preparing the final CQV

**10.3.3** The final inspection is required to be performed before the Resident Engineer can initiate Contract Closeout.

**10.4 Procedure - Please Refer to the Project Manager’s Manual Section 10-Closeout**

**4.1 Files**

After the contract has been completely closed out, the Resident Engineer shall transfer the project records. Upon final closeout, the RE shall retain the records according to Section 2.3 and 4.5.

**4.2 Close-out Forms**

Up to date forms for use by the Resident Engineer and Project Manager, such as Forms 6, 7, 8, 9, are available in the MBTA Capital Management System (CMS).

**10.5 Exhibits**

 **CMS Forms**

**Certificate for Substantial Completions, Form 6**

**Notification – Opening Portions of Contract for Operations, Form 7**

**Construction Contract Closeout Summary**

**Certificate of Completion and Release, Form 8**

**Certificate of Inspection and Acceptance, Form 9**

 **PM Manual Close-Out Procedures available on www.mbta.com**

**Exhibit 10.1 – Substantial Completion Flow Chart**

**Exhibit 10.2 - Sample Cover Memorandum to Contract Administration Accompanying Final Pay Estimate Package**

 **Exhibit 10.3 – Construction Contract Closeout Summary Form**

**Exhibit 10.4 - Document Control Archive Form**

****

**Exhibit 10.2**

**SAMPLE COVER MEMORANDUM TO CONTRACT ADMINISTRATION**

**ACCOMPANYING FINAL PAY ESTIMATE PACKAGE**

**TO:** (Deputy Director of Design and Construction – Contract Administration)

**FROM:** (Project Manager)

**DATE:**

**SUBJECT:** MBTA Contract No. \_\_\_\_\_\_\_\_\_\_\_\_\_

 Final Estimate and Release of Retainage

Attached are copies of all necessary forms and final estimate for the above contract.

Based on the reality that the Contract is 100% complete and substantial completion was obtained, the project recommends that you process this final payment in order to close out the contract.

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 (Signature)

 Project Manager

Attachments

**EXHIBIT 10.3**

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY

CONSTRUCTION CONTRACT CLOSEOUT SUMMARY

CONTRACT NO \_\_\_\_\_\_\_\_\_\_\_\_\_\_ FINAL PAYMENT \_\_\_\_\_\_\_\_\_\_\_\_

DESCRIPTION \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

CONTRACTOR \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

A. AWARD \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

B. Change Orders No. \_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

C. Claims No. \_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

D. B&E/CQV Reports (Allowances Only) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

E. AUTHORIZED CONTRACT VALUE \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

F. B&E/CQV Reports (Excluding Allowances) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

G. TOTAL PROJECT COST (Total Work-to-Date) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

ADJUSTMENTS TO CONTRACT AWARD

H. Total Project Cost to Award (G divided by A) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

I. Change Orders to Award (C divided by A) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

J. Claims to Award (C divided by A) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

K. B&E/CQV Reports to Award (D+F divided by A) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 B&E/ CQV Allowance to Award (D divided by A) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 B&E/CQV/Items/C.O.’s to Award (F divided by A) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

l. DBE Participation Reported Through This Payment \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

M. DBE Goal \_\_\_\_\_ DBE Participation (L divided by A) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

N. Second Low Bidder \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

O. Second Low Bidder’s Computer Bid Total \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

P. Difference between Second Low Bid and

 Award (Difference of A and O; divided by A) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Project Manager

**EXHBIT 10.4**

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