**MBTA**

**[Insert project name]**

**PROJECT**

**MANAGEMENT**

**PLAN**

**Template**

**[insert date]**



**PROJECT MANAGEMENT PLAN –[insert project phase]**

**ENDORSEMENT PAGE**

[Insert name of project manager]

Project Manager

Reviewed by: [insert name]

Project Controls

Approved by: [insert name of AGM]

Assistant General Manager for Design and Construction

**Revision Log**

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| --- | --- | --- | --- |
| **Revision** | **Date of Issuance** | **Description of Changes** | **Sections Revised** |
| [revision #] | [insert date] | [description of change] | [section revised] |
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#

# 1. Introduction

## 1.1 Purpose of the Project Management Plan

The Massachusetts Bay Transportation Authority (MBTA) has prepared this Project Management Plan that provides a basis for administering the design, construction of the [insert project name]Project. This document outlines the management philosophy, goals and objectives, and organizational structure; defines the responsibilities and roles of project participants; identifies the interactions among project staff and consultants; and specifies the general procedures and management tools that will be implemented to ensure effective project management and successful project completion. This Project Management Plan defines the details of management of project implementation during preliminary engineering design and provides the framework for managing the subsequent final design, construction, procurement, testing and startup phases.

In addition to serving as a guide for all project participants and assisting in clarifying their respective roles, responsibilities and assignments, this document will serve as a basis for measuring and assessing the project’s performance and consistency with the plan. The MBTA will provide the necessary elements to allow for proper and effective management upon completion of this project. As design and construction work advances and additional procedures are developed the MBTA will update the plan as needed and appropriate.

The development of the Project Management Plan will be an evolutionary process. The PMP will be updated and revised as needed, as the program proceeds through its various phases. The maintenance of and subsequent revisions to the PMP are the responsibility of the MBTA.

The parties requesting the revision issues a written request to the MBTA stating the proposed change(s) and the reason(s) for the changes. The MBTA reviews each request. If the proposed revision(s) is approved, the MBTA issues the change(s) to all recipients of the manual. A published revision will include:

* a cover memo describing how and where to place the revision in the manual (revision instructions);
* a new cover page with revised date;
* a revised Table of Contents, if required;
* the revised pages of text with revision number and revision date placed at the bottom of the page; and
* a side-bar in the right hand margin of the page for changes to the text.

## 1.2 MBTA Legal Authority

Massachusetts Bay Transportation Authority (MBTA) is a body politic and corporate, and a political subdivision of the Commonwealth of Massachusetts. The MBTA is duly organized and existing pursuant to Chapter 161A of the Massachusetts General Laws (as amended) and having a usual place of business at 10 Park Plaza, Boston, Massachusetts. Its primary purpose is to hold, operate and manage the mass transportation facilities and equipment acquired by the Authority.

The [insert project name] Project Management Team will design and oversee the construction of the project in accordance with all applicable federal and state laws and regulations, codes and guidelines. In addition, the Team will proactively work to provide community outreach and relations to ensure the project is compatible not only with city regulations, services and facilities, but with the community and businesses abutting the project.

## 1.3 Project Objectives

*[Explain project objectives]*

## 1.4 Project Description

[Brief overview of project]

* 1. **Grant Budget**

*[List each grant and its value]*

* 1. **Total Project Budget**

*[Provide Project budget]*

* 1. **Project Completion Date**

*[Provide grant project completion date and current substantial completion date]*

# 2. Organization and Staffing

To successfully manage the planning, design, and construction of the [insert project name] Project, an integrated team of Authority and consultant staff will be established. This section describes the organization and its structure. It provides a description of the functions, major responsibilities, and qualifications of the senior executives and key managers involved.

The [insert project name] Equal Employment Opportunity (EEO) policy is the same one that is incorporated by the MBTA and the consultant firms that comprise the Project Team. This section affirms the project’s commitment to fair employment considerations for all applicants considered for employment or procurement activities.

## 2.1 Project Organization

The [insert project name] Project will be accomplished by the concerted efforts of various organizations and responsible parties, who will work together as an integrated team providing multiple levels of oversight to ensure a successful outcome. The “Project Team” for [insert project name] Project is the combined staff of the MBTA and the Design Consultant. The Design Team primarily includes the Design Consultant and all associated subconsultants. The Team also consists of other key support and oversight organizations such as the FTA. The Project Team will work towards the common goal of successfully completing the project and meeting the expectations of the Project stakeholders. The Design Team is responsible for planning, designing, and completion of all state and federal environmental review documents as well as all documents and submittals required.

The following sections describe the structure, integration, and interfaces of the project organization. For clarity, the MBTA organization will be described in Section 2.2 followed by the Design Consultant described in Section 2.3. Organization charts for both the MBTA and Design Consultant are provided in Figures 2-1 and 2-2, respectively, at the end of this section.

## 2.2 Project Management Team

The Project Management Team (PMT) is an integrated staff of managers and personnel from the MBTA and the Design Consultant. The PMT reduces overlaps in duties and functions and provides the flexibility to accomplish project objectives effectively and efficiently. To illustrate the structure, refer to the organization chart (Figure 1) at the end of this section.

The PMT is led by the Project Manager, Area Director and Assistant General Manager for Design and Construction, who report to the General Manager and Rail & Transit Administrator of the MBTA. Different areas of expertise from various departments within the MBTA support the GM.

This basic structure will be maintained throughout the project’s life providing continuity between phases and maintaining effective project communications. The positions of General Manager and Rail & Transit Administrator, Assistant General Manager for Design and Construction, Project Manager and listed staff define the Project Management Team. In addition, various MBTA departments are supporting the Project Management Team.

Figure 1 – Integrated Project Management Team

#

[Insert Organizational Chart of MBTA and Design Consultant]The MBTA key staff by position (and current personnel) is:

##### **MBTA General Manager and Rail & Transit Administrator**

The MBTA General Manager and Rail & Transit Administrator (GM) provides executive leadership and guidance regarding policy issues and project financing. The GM is responsible for all operations, facilities, and projects at the MBTA. The GM is available to address issues requiring top-level decision-making in support of the project schedule.

**Assistant General Manager for Design and Construction**

The Assistant General Manager (AGM) for Design and Construction reports directly to the GM of the MBTA. The AGM for Design and Construction serves as the direct supervisor of all MBTA design and construction projects providing executive guidance.

*Accountability*

The AGM reports directly to the MBTA General Manager.

**Chief of Design and Construction**

The Chief of Design and Construction reports directly to the AGM. The Chief of Design and Construction provides oversight to all projects in relation to design and construction issues.

*Accountability*

The Chief of Design and Construction reports directly to the AGM.

**Director of** *[Provide Area]*

The Director reports directly to the Chief of Design and Construction. The Director serves as the supervisor of this project providing executive guidance.

*Accountability*

The Director reports directly to the Chief of Design and Construction.

**Project Manager**

The Project Manager is the authorized representative of the MBTA and reports to the AGM for Design and Construction indirectly through the Director of Design and Construction. The Project Manager is responsible for day-to-day oversight of the Design Consultant in accordance to specifications, design direction, and schedule. The Project Manager directs all elements of work required for the scope, design, construction, and delivery of the Project. The Project Manager is the single point of contact for all official information on the project. All project activities are coordinated through the Project Manager including acting as liaison with the FTA.

*Major Responsibilities*

* Evaluate project cost at each design phase submissions.
* Review all project documents at each design phase submission.
* Review all related project agreements, including interagency and other third party agreements.
* Assist with managing the planning, scope, design and engineering, construction administration, and construction inspection to deliver timely, cost-effective, and high quality projects for the MBTA.
* Review progress reports in accordance with the scope to maintain schedule and budget.
* Coordinate with MBTA Departments and other key stakeholders.
* Represent the MBTA with outside agencies and community groups.
* Manage/Oversee the Contractor during the construction process to ensure the successful completion of the Project.

*Accountability*

The Project Manager reports directly to the Director for Design and Construction.

## Design Consultant

 [Identify the Design Consultant, their role and responsibility]

The Design Consultant organization/Team consists of the following:

[List the Team disciplines]

The Design Consultant organization is described in more detail in the descriptions that follow.

### Design Consultant Team

[Identify each task discipline classification lead (i.e Officer in Charge, Project Manager, Design Lead, Architectural Lead, Structural Design Lead, Signal Lead, Project Controls Lead, Civil, Electrical Lead, ect…]

[List task leader’s responsibilities as it relates to this project]

[Identify what position the task leaders are accountable to]

## 2.4 Governmental and Oversight Agencies

### 2.4.1 Federal Agencies (if applicable)

[Indicate if this project will be federally funded]

[Identify which Federal agency has oversight of this project]

### 2.4.2 Local Agencies

[Identify the location of the project]

[Identify which local agencies and departments the project must coordinate with]

### 2.4.3 Regulatory Agencies

[Describe all regulatory agencies the Project will have to interface with]

The Project designed will be reviewed the Massachusetts Department of Public Safety for compliance with the State Building Code, \_\_\_\_\_\_\_\_ Edition, NFPA \_\_\_\_\_\_\_and ADA.

### 2.4.4 Utilities

This project may affect the right-of-way of various utilities. The following is a list of utilities that may be affected:

* [insert utility - example; City of Somerville DPW]
* [insert utility - example; Verizon]
* [insert utility - example; Nstar]

### 2.4.5 Developer Team (if applicable)

[Name of developer team, if applicable]

## 2.5 Equal Employment Opportunity Policy

The MBTA has developed its EEO policy, which prohibits discrimination against any person in employment and/or in access to contracts. Further, it is the MBTA’s policy to make certain that all applicants are considered for employment, or procurement opportunities regardless of race, religion, creed, color, sex, age, national origin, disability, or marital status. All consultants will comply with the MBTA policy, as well as the Federal EEO policy.

The [insert project name] Project EEO policy will adopt the policy of the MBTA. As defined in this policy, affirmative action will include, but not be limited to, recruitment, hiring, promotion, compensation, benefits, transfers, layoffs, recalls, company sponsored training, education, and social and recreational programs. Goals with specific measurement factors are established to assist management’s progress toward finding remedies to any apparent discrimination.

The [insert project name] Project bases decisions on the individual’s qualifications as related to the position for which he or she is being considered. In this regard, rules of conduct are enforced equitably and impartially.

# 3. Management Control

## 3.1 Technical Control

Functional control of the Project will be guided by the MBTA Project Manager’s Manual (PMM) and the Project Controls Policy Manual (PCPM) that will be used by the Design Consultant and the MBTA. The PMM and PCPM will include topics such as correspondence control, invoicing procedures, project reporting, file management, and other items pertinent to the execution of the Program. The format and content of the PMP will be consistent with the MBTA Project Controls Policy Manual, and will be submitted to the MBTA for review and concurrence. The PMP will outline in general terms the procedures common to all Project participants.

Technical control of the Project will be administered by the Design Consultant and will follow the requirements of and full knowledge of input sources and guidance documents by the use of Design Task Protocols (DTP’s). The intent of DTP’s is to provide those preparing technical documents with the input, references, criteria, direction, and background information necessary to carry out their tasks in a complete and efficient manner. DTP’s will be completed for calculations, and may be used as input to specifications, drawings, and technical reports and studies. Exceptions to this requirement are cases where the tasks are simple or for information only, or where the input information is readily available or developed in another manner for the project (e.g. Design Criteria Document). Depending on complexity, DTP’s may be developed for single documents or tasks, groups of documents or tasks, or at the project level.

### 3.1.1 Technical Baseline /Configuration Control

[What is the project’s approach to defining and establishing a technical baseline]

[Explain the project approach to configuration management]

### 3.1.2 Design Reviews/Constructability/Risk

 Design Reviews, as described in the MBTA’s design review procedure (as contained in the MBTA’s Project Management Manual, which is appended to this PMP as Attachment B) are an integral part of the design process and necessary to ensure that both the right problem is solved and that it is solved correctly. The quality assurance process for reviews is organized by phase, by discipline and across disciplines. It is both a pro-active and a reactive process; it is pro-active in the systems that are set up and the steps that are required, and it is reactive in the review of data and drawings by senior staff.

*[Describe the process the Project will use for design reviews and constructability reviews]*

*[Against what criteria will design reviews and constructability reviews be based]*

### 3.1.3 QA/QC Program

 [Describe in detail the QA/QC plan that will be used for this project]

## 3.2. Cost Control

[Explain the cost controls system that will be utilized for this project]

[What reporting system will be used?]

[How often will reports be submitted to T?]

[How will trends, forecasts and variances be reported on and by what means?]

[Identify what cost elements of the project will be monitored and what is excluded]

[How will requirements of the MBTA’s Project Controls Policy Manual are incorporated into the Projects Cost Control Program]

### 3.2.1 Maintaining Baseline Project Cost

The Baseline Program budget will be developed at the end of the [ enter phase ] phase (approximately 30%), after the alignment is refined and the project is very well defined. This will be the cost basis against which future performance will be measured. The Engineer’s Estimate will be reviewed at each design phase of completion to assure budget accuracy. Contractor bids and performance will be constantly monitored during construction for consistency with the baseline budget.

The program budget will be updated as conditions or changes warrant. Any updates to the budget require review and approval, at a minimum, by the MBTA Director.

### 3.2.2 Performance Measurement

[Explain what kind of performance metrics will the Project utilize during design and construction to monitor and measure progress?]

### 3.2.3 Cost Estimating

### 3.2.3.1 Estimating Methodology

[Explain what estimating methodology will be used]

### 3.2.3.2 Quantity Take-offs

[How will quantity take offs be performed?]

[What technology will be utilized?]

### 3.2.3.3 Pricing

[Explain how pricing will be obtained for labor, equipment, materials and indirect costs]

### 3.2.3.4 Estimating Software

[What estimating software will the project employ?]

### 3.2.4 Contingency Management

[Explain how contingency will be determined and managed? See sample below.]

*Sample*

*Contingency funding is a fiscal planning tool for managing the risk of cost escalations and covering potential cost estimate shortfalls. Inclusion of a contingency amount in the cost estimate will minimize the impact of cost increases inherent in an overly optimistic estimate and provide for an earlier discussion of how potential circumstances can be addressed.*

*Risks will be defined with specific costs allocated to them, as determined by a risk analysis, as opposed to just "bumping up" the total cost. A risk allocated cost contingency will be included in the total project cost estimate for the mitigation of all significant risks. Risk management and contingency funding can be utilized to mitigate those risks that cause cost escalations throughout the project continuum.*

*During the preparation of the initial estimate, a risk assessment will be performed on the entire project in order to define and quantify the potential risk areas and types. Risk assessments will continue also be performed periodically throughout the project continuum to update contingency amounts. Some examples of risk assessment areas include the analysis of differing site conditions, utility impacts, hazardous materials, environmental considerations, third-party concerns, geological conditions, etc.*

*When preparing the project cost estimate, a risk assessment will include allocating risk contingencies for major cost elements. This will assist in the mitigation of uncertainties and help create a conservative cost expectation. Probability of occurrence, severity and expected dollar value are variables that may be utilized when quantifying risk as a contingency amount. After all known risk mitigation, the cost estimate's contingency-funding levels should reflect the amount of remaining risk associated with the project's major cost elements. Additionally, an overall management contingency can be included to cover unknown, unanticipated risks.*

*The following are major cost elements for contingencies that should be considered for Major Projects: 1) a Construction contingency to cover cost growth during construction; 2) a Design contingency (based on different levels of design completion); 3) an overall Management contingency for third-party and other unanticipated changes; and 4) other contingencies for areas that may show a high potential for risk and change, i.e., environmental mitigation, right-of-way, utilities, highly specialized designs, etc. Other areas of interest for contingency cost estimating may include contractor availability and historical contingency levels for similar projects.*

*Construction contingencies will be established and adjusted based on the assessed risk in exposure to construction cost escalations. Project funding will be reviewed at periodic intervals and unused contingency funds can be released to be made available for other contracts.*

*Design contingency amounts will be based on the amount of design completed. When the final design is complete, the design contingency amount in the cost estimate will equal zero. Projects under design are not over estimated; however the contingency is based on the uncertainty inherent in the remaining design to be completed.*

*The MBTA’s Management responsibility will include managing cost and schedule deviations from the approved budget and schedule, impacts resulting from the deviations, and initiatives being analyzed or implemented in order to recover any cost overruns or schedule delays. While individual construction contracts will be analyzed for exposure to changes, comprehensive risk and contingency management tools and processes are not always in place. Project contingency funding management procedures will include continual comprehensive risk analysis to quantify and refine contract contingencies, individual contract contingency tracking, and a contingency drawdown plan that includes contingency forecasting.*

*An overall management contingency will be incorporated. This contingency will be a "stand alone" piece of the cost estimate that is managed by the MBTA Director and will be used for a broad spectrum of uncertainties.*

*Management of the transfer of costs to and from contingency line items will be administered and tracked carefully for decision makers. Cost transfers will be correlated to the major element type of cost escalation. For example, if work outside of a clearly defined scope is found to be essential and justifiable in the future, then a management decision can be made to pay for the added work from the management contingency or another appropriate contingency. On the other hand, if a specific utility issue that has a utility contingency, careful tracking of this particular contingency can help management better analyze cost overruns.*

*Reasons supporting contingency transfers will be noted and included in all pertinent reporting. This is so a comparison analysis to the available contingency amounts can be periodically analyzed for contingency usage rates. This analysis will show MBTA Executive Managers that a reasonable and sufficient amount of contingency remains to keep the project within the latest approved budget.*

### 3.2.5 Escalation Factor Derivation

*[Explain how escalation for this project will be derived. ]*

### 3.2.6 Contracting Techniques

*[Which project delivery methods are being considered for this project?]*

*[Explain each method]*

[At what point in the design will the project delivery method be chosen?]

### 3.2.7 Cost Allocation Plan

The Preliminary Project Budget is $XXXX million as outlined below.

|  |  |
| --- | --- |
| **Category** | **Budget (millions)** |
| Professional Services | $ |
| Real Estate | $ |
| Construction | $ |
| Inspection | $ |
| Force Account | $ |
| Project Administration | $ |
| Contingency | $ |

Table 1

### 3.2.8 Cost Accounting Plan

The MBTA Project Manager is responsible for monitoring of project commitments, expenditures, and other costs. A computerized cost control system will be used to facilitate the gathering and analysis of cost information. The cost tracking system will be based on the WBS detail elements and detailed Chart of Accounts. Information will be gathered and entered into the system at the account level and summarized or recombined as needed.

A Work Breakdown Structure (WBS) has been developed as a means of organizing all work elements to be completed for the Program/Project. By coding the cost and schedule information to the appropriate WBS element, detailed reports are produced for all levels of reporting. The WBS forms the basis for all scheduling, cost, estimating, document control reporting.

The Program/Project WBS is arranged in hierarchical levels.

Figure 3 on the next page shows the MBTA typical WBS structure. The [insert project name] Project will develop a project specific WBS in line with the MBTA’s typical WBS:









The Cost Control System will include the following basic elements:

*[List and define the elements of the cost control system]*

### 3.2.9 MBTA Force Account Plan

A preliminary force account budget and plan has been developed in cooperation with the Design Consultant. The anticipated force account needs include the following:

* [Insert line, ex. red, orange..]Line Diversions –[insert amount]
* [Commuter Rail] Diversion – [insert amount]

The force account budget currently available is presented in the Cost Allocation Plan in Section 3.2.7. The total force account budget as of [insert date] is approximately [insert amount] .

The force account budget will be updated at regular intervals during the design phase. Joint meetings with the Director of Subway Operations, the AGM for Design and Construction and other MBTA personnel will be held to balance operations requirements, customer service, and construction activities.

Force account costs for the use of MBTA Transit Police are contained in the construction estimate.

## 3.3 Schedule Control

Through the use of several levels of schedules, in accordance with the Project Controls Policy Manual, strict schedule management and control is the responsibility of the Design Consultant, with input from MBTA Project Manager and all project participants on the [insert project name] Project. This is accomplished through a stringent change control process, and a comprehensive monitoring and reporting system as described in the Project Controls Policy Manual.

The [name of project] uses industry standard scheduling software to develop and manage the schedule. The [name of project] has selected Primavera to provide consistent reporting of the Master Schedule and all program/project elements. Schedules generated by the consultant and all contractors, use the Primavera software for the purpose of maintaining uniformity and compatibility between interrelated project schedules, work calendars and resources

### 3.3.1 Types of Schedules

The schedules used for the [insert project name] Project will be:

*[List the types of schedules to be used on this project]*

[Explain the level of detail that will make up each schedule type]

Figure 2 – Project Schedule

[Insert Master Schedule]

### 3.3.2 Schedule Development, Progress Monitoring

*[Explain how schedules will be developed and how progress will be monitored]*

### 3.3.3 Schedule Reporting

*[Identify who will issue schedule reports]*

*[What will be reported on?]*

*[How often will reports be issued]*

*[Who will receive schedule reports?]*

### 3.3.4 Earned Value Reporting

*[Explain how Earned Value will be incorporated, monitored and reported on for this Project. See Project Controls Policy Manual for more information.]*

### 3.3.5 Schedule Updates

*[Explain the schedule update process that will be used for this Project]*

*[Identify who is responsible for providing schedule updates]*

*[Identify who is responsible reviewing schedule updates]*

## 3.4 Cash Management

The Authority’s Capital Investment Program is financed by five sources of funds: revenue bonds, federal grant anticipation notes, pay-as-you-go capital, federal grants and project financing. In the event the Authority requests federal funds and those funds are not available in a timely manner, the MBTA would use either bond funds or pay-as-you-go-capital until the federal funds are received. Upon receipt of the federal funds either bond funds or pay-as-you-go-capital would be reimbursed.

## 3.5 Change Control

[Explain the Change Control process that will be used for this Project. See the MBTA’s Project Controls Policy Manual and Change Order Guidelines for more information for more information]

The Project will follow procedures outlined in the Project Controls Policy Manual and Change Order Guidelines.

## 3.6 Document Control

The Project will follow procedures outlined in the MBTA’s Project Manager’s Manual; Project Controls Policy Manual and Change Order Guidelines.

The Design Consultant will be responsible for maintaining the official project documents including, but not limited to:

* **Central Files** – All correspondence/documentation between the MBTA, Design Consultant, Contractors, and third parties.
* **Controlled Files** – A controlled set of project documents (plans, specifications, manuals and procedures), including approved changes.
* **Library – Reference** documentation for use by project personnel, such as Environmental Assessment, codes, standards, maps, etc.

In addition, the Design Consultant will establish measures for the storage and protection of vital records that will assure the continued operations of the project, in the event of a disaster.

### 3.6.1 Records Management

The Design Consultant will use the established MBTA archival system, using standardized forms that incorporate file descriptions and control fields that will automate the date entry process for archiving project documentation.

### 3.6.2 Document Control

[Identify and explain any specialized software that will be used for Document Control]

All project personnel generating or receiving project documentation will be responsible for conforming to the document preparation and identification standards set forth in the Project Document Control Procedures.

The Design Consultant will maintain the Central Files, Controlled Files, and Library. The Design Consultant will establish a universal file coding structure which will index all incoming and outgoing project correspondence and documentation received by postal mail, courier mail, hand delivery, fax, and email.

All documentation that is generated for the project will be forwarded to the Design Consultant who will be responsible for processing all project correspondence/documentation and filing including stamping, logging, copying, routing and distribution to designated project personnel.

The Project Design Quality Assurance Manager and Document Control Manager will perform routine audits of the files to ensure file integrity and compliance with the Document Control procedures. The Project Design Quality Assurance Manager will report violations and recommend corrective actions to the Project Manager.

# 4. Human Resources Management

## 4.1 General Approach and Responsibilities

The MBTA Project Manager reserves the right to request replacement of key staff when, in his/her sole discretion, the existing staff does not serve the best interests of the Project. The MBTA Project Manager will request a decision will be made based on a mutual agreement with both parties as to what is most beneficial to the Project.

Each participating contractor has a separate and unique human resources system and each retains the right to hire, promote, transfer or terminate employees in accordance with its own specific policies and consistent with federal, state and local laws and regulations. Payroll and benefits administration remain the responsibility of the individual firms as does staffing, selection, evaluation and discipline.

## 4.2 Statutory and Regulatory Requirements

The Project’s participants, including the PM, and design and construction contractors, shall use their best efforts to comply with all relevant federal and State laws and regulations.

## 4.3 Employment and Business Utilization Goals

The contract documents contain provisions concerning employment requirements and the Disadvantaged Business Enterprise goals for the selected Construction Contractor. These include:

* Design Disadvantaged Business Enterprise (DBE) participation goals of [insert %]
* Construction Disadvantaged Business Enterprise (DBE) participation goals of [insert %].

## 4.4 Labor Relations

All federally funded MBTA Projects will comply with the Federal Davis Bacon Act regarding wages on federally assisted construction projects.

# 5. Risk Management and Insurance

## 5.1 Scope

The Project will follow the procedures outlined in the Project Controls Policy Manual.

The scope of the MBTA’s approach to Risk Management, and ultimately a decision on how to obtain cost-effective insurance coverage, is structured and well founded on significant experience in the development and construction of major capital projects. Risk Management is broken down into five distinct activities:

1. Risk Identification
2. Risk Evaluation: Magnitude; Probability; Schedule Implications
3. Risk Mitigation/Control
4. Risk Allocation
5. Insurance Methodology

Managing the risks associated with the project in this manner allows a more accurate reflection of the costs and contingencies necessary to ensure that a project budget is established that allows for a high probability that the project may be constructed and closed out within the budget and schedule established.

## 5.2 Risk Identification

Through a coordinated effort between the MBTA the Design Consultant, and the FTA, a Risk Register is prepared identifying all of the possible risks that may affect the Project anywhere along the course of its development from design to construction to start-up and being placed into revenue service. Risks may span from geo-political to design to procurement to environmental to technical to economical.

The Risk Register is used to identify, classify, organize, evaluate, and track all levels of risks that may affect the project. Mitigation strategies are then identified and tracked for implementation at the appropriate times during the timeline of the project.

## 5.3 Evaluation

Each risk identified and listed on the Risk Register is evaluated for its potential affect on scope, cost, and/or schedule of the project. A determination is made as to the following:

* Magnitude of the cost to the project should this risk occur;
* Probability of the risk occurring; and
* Impact to the schedule should the risk occur; and
* Mitigation strategies that when implemented may eliminate or reduce the cost impact, eliminate or reduce the likelihood of occurrence, and/or eliminate or reduce the potential impact to the project schedule of that particular risk.

## Risk Mitigation/Control

Mitigation strategies that when implemented may eliminate or reduce the cost impact, eliminate or reduce the likelihood of occurrence, and/or eliminate or reduce the potential impact to the project schedule of that particular risk.

Risk Control is facilitated by maintaining the Risk Register as a “living” document throughout the life of the project. After Risk Identification and Evaluation, Controlling of the risks is done through determination of proper and potential mitigations that could be implemented. Those mitigation strategies are tracked and confirmed that they were in fact implemented and results monitored. Then proper Risk Allocation is accomplished through the MBTA’s Terms and Conditions and through the strategy used in the writing of the Technical Provisions, i.e., determination of measurement and payment provisions.

1. **Risk Allocation**

Allocation of risk should be to the entity that can best control that particular risk. Massachusetts Bay Transportation Authority (MBTA) is a body politic and corporate, and a political subdivision of the Commonwealth of Massachusetts. Therefore, as an agency it is inherently conservative and risk adverse. Allocation of risk onto contractors and/or through the purchase of insurance protects the MBTA. However, in today’s construction environment and contractor’s growing aversion or unwillingness to take on unquantifiable risks, a more strategic allocation of risk must be made to the entity that can best control or mitigate that risk – and in certain cases that may be the MBTA.

## 5.6 Insurance

The MBTA has utilized both Contractor Supplied Insurance(CCIP) and Owner Controlled Insurance Programs (OCIP) on its various capital projects and the determination as to which to use was made on a project by project basis.

The decision as to which insurance avenue to pursue for the project must be made in early [insert year] in order to facilitate the commencement of construction in [insert month/year]. The MBTA’s procurement of an OCIP policy for the Project will take approximately [insert duration].

# 6. Environmental Assessment and Mitigation

[Describe environmental requirements and processes]

# 7. Procurement of Services

This section focuses on the development of procurement packages for construction to achieve project goals. The section also addresses affirmative action requirements and contract modifications. The section is broken down as follows:

* Procurement of Construction Contracts
* Affirmative Action Goals
* Contract Modifications

## 7.1 Procurement of Construction Contracts

[Describe procurement planned]

The contractor procurement will be in accordance with MBTA’s Procurement Policy that also defines the level and degree of responsibilities.

## 7.2 Affirmative Action Goals

The MBTA EEO Office establishes the affirmative action goals for both consultant and construction contracts, within the parameters of State and Federal guidelines that require that construction by third parties be procured by free, open and unrestricted competition.

# 8. Procurement of Materials and Equipment

## 8.1 General Approach and Responsibilities

Conventional procurement has been successfully used for major projects by the MBTA, and throughout the United States, and will be utilized for the [insert project name] Project

Procurement objectives include:

[Describe approach]

## 8.2 Regulatory Environment for Procurement

[Describe Regulatory Requirements]

## 8.3 Contract Types

The Contractor will follow the procedures of the MBTA Procurement Manual.

## 8.4 Code of Conduct

The Project is governed by guidelines set forth in the MBTA Procurement Manual.

## 8.5 Contract Proposal and Award Process

The process of contract award will follow the listed sequence, with primary responsibility for each sequence item listed in parentheses:

* Prepare wording and procedure for advertisement for Bidders (PMT),
* Place advertisement, according to the agreed procedure (MBTA);
* Construction bid documents will be available (MBTA);
* Information meeting for qualified contractors (MBTA);
* Receive and open sealed bids (MBTA);
* Complete evaluation of bids., (PMT);
* Final contractor discussion, prior to final bid and award (PMT); and
* Award contracts (MBTA).

# 9. Design Program

The design phase will be undertaken with multidisciplinary teams and provide designs that meet the project objectives and the various targets of quality, cost, and time. Design management and planning will be accomplished through the project management and control elements as described herein. This section describes the design input and criteria control, design control, design review processes, design changes and CADD and GIS design standards. It also defines the use of an EMS and its components and implementation. The use of a value engineering (VE) consultant is stipulated, and the roles of value engineers are defined. The MBTA will procure the VE consultant and manage this process.

## 9.1 Requirements and Standards

The MBTA will have design requirements for the project, which will include:

* Project Objectives
* Operational Requirements
* Functional Requirements
* Operational and Maintenance Preferences
* Existing Design Standards and Guidelines
* Project approved design criteria

The Design Consultant will review all relevant MBTA, city, state, and federal codes and standards and select the most appropriate design criteria for the project. The Design Consultant will consolidate the criteria for the project in the Project Design Criteria memorandum, which will then be used to complete the design. Design inputs may include:

* Functional and Performance Requirements
* Regulatory Requirements, including the Americans with Disabilities Act (ADA) Compliance
* Codes and Standards
* MBTA Requirements or Preferences
* Previous Experience (Lessons Learned from Stage II)
* Proven Methods or Processes
* Engineering Judgment
* Investigation Data
* Existing or Previous Design Data

Design inputs shall be controlled to ensure that the history of design is maintained and that proper changes are made when they occur. Control is maintained through the process of identification, maintenance, and update of criteria. Identification occurs in design criteria documents, calculations, and design reports. The input documents are maintained through the document control process.

## 9.2 Design Supervision

The overall responsibility for the technical aspects of the design rests with the individual Discipline Design Leads and upwards to the Deputy Project Manager – Engineering/Design and ultimately to the Project Manager.

The Design Consultant will establish a standard method of communication and protocols to ensure that high-level technical decisions are made in an open and expeditious manner. This manner of communication also provides an efficient means for senior project committees to achieve timely decisions consistent with the overall project goals while keeping MBTA management and technical staff abreast of design issues. The process ensures that real-time knowledge is shared allowing for immediate action in response to changes to the in-process design.

Confirmation of design decisions will be provided by the MBTA Project Manager and upwards through the Director to the Assistant General Manager for Design and Construction.

## 9.3 Design Coordination – Internal, External

There are two levels of Internal Design Coordination, first being internal to the Design Consultant and the second being internal to the MBTA/Design Consultant Team.

[Designer explains their design coordination here]

The Design Consultant holds regularly scheduled weekly Senior/Technical Management meetings where specific design coordination issues are discussed and major technical resolutions are presented. The MBTA Management Team attends these meetings as well. At these meetings, further meetings are established between the Design Consultant and the various MBTA Engineering and/or Facilities and Operations people for their input, review and confirmation of specific technical solutions to issues.

Major technical issues and proposed solutions are presented to the Project Development Group (PDG). The PDG is comprised of the MBTA senior management and technical and operations staff to be identified. This group is responsible for collectively evaluating technical proposals, suggestions, or significant issues requiring resolution. The group will then make recommendations to the MBTA Program Manager who is ultimately responsible for the project decisions.

To ensure expeditious resolution of design issues and proper coordination, and as stated in Section 2.0 Organization and Staffing, the Project Manager is responsible for all aspects of the project. The MBTA Program Manager is responsible for the day-to-day activities of the project and regular interface with the Design Team. The PDG was formed to have senior representatives with a common goal of advising the MBTA Program Manager on technical and operational issues and have a forum for discussion and input with various points of view.

## 9.4 Design Review Process

Design reviews, as described in the MBTA’s design review procedure (as contained in the MBTA’s Project Management Manual) are an integral part of the design process and necessary to ensure that both the right problem is solved and that it is solved correctly. The quality assurance process for reviews is organized by Phase, by discipline, and across disciplines. It is both a pro-active and a reactive process; it is pro-active in the systems that are set up and the steps that are required, and it is reactive in the review of data and drawings after their creation by senior staff.

The “Pro-active” Review systems are developed to assist engineering in controlling the design process. These systems elements are set up at the beginning of the project to enable efficient and complete project reviews including:

* Deliverables matrices that define what is required for each deliverable by discipline.
* Information management systems that ensure the latest information is available to all parties.
* Issue tracking system to ensure resolution before deliverables are due.
* Identification of responsible reviewer by discipline and by overall deliverable (cross-discipline).
* Creation of project-specific checklists for reviews, both within discipline and cross-discipline.

The “Standards and Criteria” Review process used during design will begin with the:

* Review of list of all applicable codes and standards;
* Review of emerging standards and agreement on their use;
* Agreement on operational and functional criteria;
* Review of study and field investigation results; and
* Review of concept design for key issues and their solutions.

Design reviews will be conducted for both individual disciplines and for multi-disciplinary coordination by senior staff, utilizing the review system tools including checklists, deliverable matrices and issues lists. Reviews will be both formal on a scheduled basis, and informal as the work progresses. The requirements for the review and approval of design deliverables are addressed within the Implementing Procedures. These elements include the internal checks from the preparer and reviewer. The procedures also address the need for interdisciplinary reviews and coordination between the departments and groups. In addition to the in-process steps, the project conducts high-level design reviews, independent reviews and peer reviews at critical project junctures.

Reviews will be occurring on an on-going basis by the senior staff. Commentary from those reviews, as well as feedback from presentations and discussions with team members, will be documented in an issues tracking system. The system works to keep all interface disciplines and organizations informed on issues, to engender discussion and provide a way of tracking an issue to resolution. The issues list then serves as a final checklist in reviews.

## 9.5 Value Engineering

The Project will follow the procedures outlined in the MBTA Project Controls Policy Manual.

The objective of Value Engineering is to generate a plan to satisfy the required function of a project at the lowest cost consistent with performance requirements, reliability and maintainability. Value Engineering must be performed early in design in order to maximize cost benefits and for the recommendations to be implemented without causing delays to the construction schedule.

A formal Value Engineering Review workshop will be conducted at the Preliminary Design (30%) submission. The review will be conducted by an independent Value Engineering Panel consisting of technical specialists from various disciplines. The Value Engineering process is independent of both the PDG design review, risk analysis and constructability reviews.

The Value Engineering Review will be conducted through the following approach endorsed by the Society of American Value Engineers (SAVE):

*Pre-Coordination (Pre-Workshop)* – The Value Engineering Team Coordinator will collect drawings, specifications, and review information. The Coordinator will make all arrangements for the study, including logistics and participant scheduling. The Design Consultant will supply the participants with copies of drawings, background reports, detailed cost data, design calculations, specifications, and design criteria. The team members will then familiarize themselves with the project.

*Orientation with Design Consultant* – This orientation will be included as part of the first workshop session. The Design Consultant will present their design rationale to the VE Team.

*Value Engineering Workshop* – The VE Workshop will be divided into the following five phases:

1. The Information Phase – The VE Team will become familiar with all detailed data pertinent to the design.

1. The Creative Phase – During this phase, the team will create an extensive list of alternatives (i.e., materials, systems, etc.). There will be no evaluation of alternatives in this phase in order to encourage the free flow of ideas.
2. The Analytical Phase – At this time, the VE Team considers the feasibility of the various alternatives developed during the Creative Phase. Each alternative will be evaluated positively rather than critically with the best ideas selected for further development.
3. The Investigation Phase – The most feasible design alternatives selected in the Analytical Phase are evaluated. Factors such as cost, performance, reliability, aesthetics, and constructability will be evaluated.
4. The Recommendation Phase – The VE Team will draft recommendations for review with the MBTA and Design Consultant. Following the review of the preliminary report, the recommendations will be finalized in the post-workshop stage, incorporating both MBTA and Design Consultant comments.

Following the workshop, the Coordinator will prepare a preliminary report summarizing the results of the team investigations for review by the designers and the MBTA. The Coordinator will also make an oral presentation to the MBTA and Design Consultant. The Coordinator will also be available to further review potential results.

The PDG will provide concurrence or suggest rejection for each VE Team recommendation. The MBTA Program Manager, however, will be responsible for making all final decisions.

After the MBTA has made final selections, the Coordinator will prepare a final report, including a project description, all VE worksheets, the listing of potential savings, and a description of the costs. The report will also discuss the cost of re-design, environmental impact studies, and any other required items resulting from the selected changes. The recommendations made in the report, with the concurrence of the MBTA, will be forwarded to the Design Consultant. The Design Consultant will implement the report recommendations in the 60% Submission.

## 9.6 Constructability Reviews

The Project will follow the procedures outlined in the MBTA Project Controls Policy Manual.

Constructability Reviews will be performed at the 60% submission. The constructability review performed at the 60% design submission is important since it provides the last chance for incorporating design modifications and revisions without significant impact on the design schedule and budget.

The constructability review will include a thorough review for design errors and omissions, potential constructability issues, use of design standards, and intersystem compatibility. Items of particular concern are schedule and project interfaces, drawing interfaces, construction package interfaces, general and special conditions, milestones, long lead procurement items, liquidated damages and penalties, and risk assignment. Contract documents are also examined to verify the contract language is consistent across the various contracts within the project.

The constructability reviews will be performed by members of both the MBTA and independent construction specialists of the Design Consultant that have not participated specifically in the design. Each constructability review will be formally documented with all comments, recommendations, alternatives proposals, etc. incorporated together with the proposed response by the Design Consultant.

## 9.7 Operations and Management (O&M)

During the course of design, all specific elements are reviewed for conformance to the Manual of Design Criteria established for the [insert project name] Project. Additionally, special meeting and/or reviews are held with the appropriate MBTA Operations or Maintenance Department to review the design and incorporate any comments pertaining to operations management or maintenance. Comments are recorded, dispositioned and tracked to ensure incorporation into the design as it progresses.

## 9.8 Change Control

The Project will follow the procedures outlined in the MBTA Project Controls Policy Manual.

## 9.9 Systems Integration

System integration is the bringing together of the component subsystems into one system and ensuring that the subsystems function together as a system. During design, the Design Consultant will develop and maintain a Systems Integration Matrix that will list all critical project components, subsystems and interfaces, and responsibilities by discipline for ensuring that in fact those specific interfaces are considered and addressed in the design.

During design of project elements, review will be made by the MBTA and PDG to ensure compatibility with existing systems. As construction and installation of systems is nearing completion, tests and other checks will be made by contractors to ensure complete system integration.

## 9.10 Reliability, Availability, Dependability and Safety

[Insert requirements]

# 10. Right-of-Way Acquisition

## 10.1 Overview

The Project will follow the procedures outlined in the MBTA Project Manager’s Manual.

Many MBTA projects require acquisition of property on a temporary and/or permanent basis. Property acquisition costs sometimes represent a large percentage of the Project budget. Accounting for property acquisition needs and costs early in a Project’s design helps avoid costly design modifications and change orders. This procedure describes how the MBTA manages Real Estate Acquisition and explains how this process is integrated into the development of the Project schedule and budget.

Some projects require acquisitions (fees, permanent easements, temporary easements, licenses, etc.). An early and accurate understanding of property acquisition and easement needs and costs allow the Project Manager to develop the most favorable land acquisition plan and an accurate Project budget and schedule by the 30% design milestone. The Project Manager works with the Acquisition staff to acquire a comprehensive understanding of the Project’s property acquisition needs and costs prior to submission of the Authorized Budget and Schedule. The appraised property value serves as a basis for negotiation with the landowner, and is also the value that is used if it is necessary to acquire property by eminent domain.

It is intended that all acquisitions and/or temporary/permanent easement agreements be completed prior to the advertisement of a construction contract.

## 10.2 Conceptual to 30% Design Property Acquisition Cost Estimates

Upon assignment to the project, the Project Manager recommends a Conceptual Budget and Schedule. This recommendation must include an estimate of property acquisition and appraisal costs. In order to ascertain these costs, the Project Manager meets with the Acquisition staff to review anticipated property acquisition needs. The two explore issues such as partial takings versus full takings, and permanent acquisition versus temporary license. Following the meeting, the Project Manager requests that the Acquisition staff provide a summary of the preliminary estimate of property acquisition costs based upon the property acquisition plans to date. These costs may be determined through the utilization of an independent appraiser and/or review of prior appraisal reports completed in the Project area. Also a review of city or town assessor’s records may help to determine the preliminary acquisition budget for the Project.

At the Preliminary Engineering completion milestone, the Project Manager and the Design Consultant will have finalized all property acquisition needs. The Project Manager also convenes at least one meeting prior to this milestone with the Acquisition staff and Design Consultant (and Real Estate Consultant, as necessary) to review the acquisition plans and explore less costly alternatives to those proposed.

The Project Manager then transfers the 30% design plans and an explanation of all property requirements to the Acquisition staff. A Right-of-Way Agent is assigned to solicit an independent appraiser to perform the appraisal assignment. Before receiving the appraisers report, Acquisition staff meets with the appraiser to verify the assumptions and methodology to see if it meets the requirements of the solicitation. After receiving the appraisal from the Certified Appraiser, the Acquisition staff review it and clarify the assumptions and methodology. Following the review, the Right-of-Way Agent assigns a Review Appraiser to conduct a formal peer review of the assumptions and methodology underlying the first appraisal and conduct a review of the first appraisal. The final recommendation of the review appraiser (Final Appraised Value) is incorporated into the Authorized Budget and Schedule and serves as the basis for negotiations with the landowner.

## 10.3 Negotiation of Final Appraised Value with Landowner

Acquisition staff forwards a formal offer to the property owner based upon the final appraised value or fair market value and negotiations commence. If preliminary agreement is reached, but the dollar amount established exceeds the Final Appraised Value, the Project Manager follows the budget modification approval procedure defined in the Authorization of Budget and Schedule procedure. Final agreement on price cannot be reached until these approval processes have been completed and the appropriate authorities of the MBTA approve the negotiated settlement.

## 10.4 License Agreements

Rather than permanently acquiring a property right, the MBTA may enter into a License Agreement with the landowner whereby the MBTA is granted temporary use of property. The Project Manager and Acquisition staff determines if the Project requires a License Agreement prior to the 30% milestone. Any funds required for a License Agreement must be incorporated into the Authorized Budget and Schedule and, if required, the approval processes set forth in the Authorization of Budget and Schedule procedures are observed.

## 10.5 Eminent Domain

If the MBTA and the landowner are unable to agree upon a price for the property in question, the MBTA acquires the property via the eminent domain process. All Orders of Taking require Board approval. Any acquisitions will be identified during Preliminary Engineering and will be subject to the following process:

* Acquisition staff prepares a Board agenda item on the taking.
* If the Board approves the Order of Taking, it must be recorded at the appropriate Registry of Deeds within 30 days of the Board vote, pursuant to Chapter 79 of the Massachusetts General Laws.
* If there are any tenants on the property being acquired, Chapter 79Aof the Massachusetts General Laws applies and each tenant must be given four (4) months notice to vacate after the recording of the Order of Taking. In addition, each tenant is entitled to relocation assistance in accordance with state and federal regulations.
* Acquisition staff maintains all acquisition files for a period of at least three (3) years from the sale of acquisition. If an action is filed regarding an Order of Taking, Acquisition staff work with the General Counsel’s office.

# 11. Community Outreach Plan

Community outreach and public participation is a crucial element to the [insert project name] Project. Its importance is so vital that the MBTA has assigned the Assistant General Manager for Community Outreach as the liaison to government officials, stakeholders, the media, and the general public. A detailed Public Participation and Community Outreach Program has been developed for preliminary engineering and design, which outlines the interfaces set up with stakeholders elected officials and government agencies. Basic information on meetings and media interface is also included.

## 11.1 Community Outreach Program Objectives

The objectives of the community relations and public participation program are to encourage an exchange of ideas and information on issues related to the project, including design consensus, identify and resolve public issues and concerns as they arise, and generate interest in and support for the [insert project name] Project. The MBTA and its consultants will be responsible for the overall public affairs program that will be in effect for the project’s life-cycle.

The Community Relations and Public Participation Outreach Program is intended to work alongside the technical and design work efforts and conform to MBTA policies. It requires a careful mix of informational activities designed to inform stakeholders about the progress of the project, and receive feedback from stakeholders that will improve the design and mitigate impacts.

## 11.2 Community Outreach Program

During each phase, outreach activities will be scheduled and structured to reflect the project’s demographic and commercial diversity; and to facilitate open communications, problem resolution, and consensus building.

The community relations and public participation plan is designed to address the concerns of:

* [insert City/Town]
* Community-based organizations, neighborhood advocacy groups, and civic groups;
* Elected officials, and government agencies

In addition, the program provides a forum for affected communities and other stakeholders, allowing the Project Team to identify and address new or unanticipated local priorities and issues.

The Public Outreach Plan will consist of the following:

* Targeted stakeholder meeting
* General information meetings for all stakeholders
* Printed materials, including fact sheets, brochures, and newsletters;
* Presentations, possibly including three dimensional models so that stakeholders may better visualize outcome

## 11.3 Interfaces with Elected Officials and Government Agencies

The team will make certain that every agency involved in, or affected by, the project receives all necessary information in a timely, accurate manner.

Contact with elected officials and federal, state, and local agencies will be coordinated through the MBTA and its consultants.

## 11.4 Media Interface

MBTA Public Affairs will handle all media requests. The MBTA Project Manager will work with the MBTA Press Office to provide information, materials, and any other support required to assist with media briefings, announcements, and press releases.

# 12. Construction Program

The Project will follow the procedures outlined in the MBTA Resident Engineer’s Manual.

## 12.1 General Approach and Responsibilities

The [insert project name] Project organization will provide an integrated team of design and construction professionals and it will emphasize safety, quality and on-time, within-budget Project completion. Construction oversight services will be a key element of the organization. The construction oversight staff will be active throughout the preliminary design, proposal and award; final design, construction and post-construction phases of the Project.

## 12.2 Pre-Award Activities

The involvement of the MBTA Design and Construction Managers during the pre-award stage of the Project is crucial to ensure that constructability issues are addressed in the preliminary design phase and in developing the methods and procedures to monitor the construction.

During the preliminary design phase, the MBTA Design and Construction Managers and their staff will be responsible for reviewing preliminary design documents for constructability and interface issues, special construction conditions and compatibility with contractual language and schedule requirements.

During the proposal phase, the MBTA Design and Construction Managers and staff will be available to attend meetings, answer questions, tour work sites with prospective contractors, review proposal cost estimates and schedules and assist in the development and issuance of addenda related to construction as required by the MBTA Project Manager.

## 12.3 Prequalification of Contractors and Vendors

All Contractors and Vendors shall be prequalified according to the requirements set forth in the MBTA’s Procedures Governing Classification and Rating of Prospective bidders.

## 12.4 Coordination of Construction

### 12.4.1 Project Schedule

A CPM Project schedule with critical milestones will be developed and made part of the bid documents. The CPM schedule is a cost-resource loaded schedule and will be used to determine the progress on the work activities which will be the basis for partial monthly payments to the Contractor. Upon contract award, the Contractor will be requested within two weeks of notice of award, to sign off on the bid schedule or to submit requests for modifications to the Project schedule. Upon review and acceptance, at the sole discretion of the MBTA, of the Contractor requested modifications, a revised construction schedule will be issued and monitored. The revised construction schedule will be issued within weeks from notice of award. The CPM Project schedule will be structured and updated on a bi-monthly basis by the Contractor and submitted to the MBTA.

### 12.4.2 Daily On-Site Meetings

The MBTA RE will hold daily meetings, as necessary, with the Contractor’s field staff to discuss and coordinate operations scheduled for that day.

### 12.4.3 Bi-Weekly Meetings

The MBTA Project Manager and RE will conduct bi-weekly progress meetings with the Contractor’s management and appropriate stakeholders and the design team to coordinate, discuss, and resolve various Project issues such as:

* Co-ordinate Monthly Activity,
* Construction Progress and Schedule Revisions,
* Material Procurement,
* Design Issues,
* Shop Drawing Submissions, and
* Safety.

### 12.4.4 Establish Point of Contact

The Contractor will assign a staff person for all contract administration issues. Meetings will be scheduled as required.

## 12.5 Change Management

The Project will follow procedures of the MBTA Change Order Guidelines.

At award, the design criteria, technical provisions, contract drawings, key schedule milestones and the contractor’s cost proposal; constitute the contractual baseline from which changes will be measured. Thereafter, any deviations from the contract baseline must be carefully documented in order to effectively manage contract changes. During construction, the MBTA’s Resident Engineer (RE) will monitor changes by maintaining an accurate and current record of the status of all change requests issued by the contractor and subsequently-approved change notices. A summary report on the status of changes will be compiled by the RE each month.

The RE will have the responsibility for reviewing Contractor change requests and making recommendations. All change requests shall be reviewed by the Design Consultant. The MBTA Project Manager will have the authority to approve changes via extra work orders or change orders.

## 12.6 Verification, Testing and Acceptance

The MBTA will monitor and review the performance of the Contractor’s approved quality program and will verify the design process and observe inspection and testing activities associated with construction and manufacturing. The MBTA RE will have the authority to perform its own inspection and testing of work to ensure that the work is in accordance with the contract requirements. Noncompliance with contract requirements will be documented utilizing the non-conformance reporting procedure.

After substantial completion of the contract, the contractor will formally request an inspection of the work and a Project "punch list" will be prepared jointly by the contractor and the RE. The RE will make a determination of final completion of the contract after all punch-list items are resolved, and upon determining that:

* All final permits, approvals, licenses, certificates, affidavits and authorizations for use and occupancy have been obtained,
* All record documentation, including as-built drawings have been submitted,
* All operating and maintenance manuals have been issued, and
* Proof that any claims or liens arising out of the work have been resolved or released.

Having confirmed that those conditions and all other contractual obligations have been met, the MBTA RE will issue a Certificate of Final Completion to the MBTA Project Manager, who will have the authority to approve final payment.

## 12.7 Warranties/Equipment Guarantees

The contract documents contain provisions requiring that the contractors warrant all work for a period of *one year.* For those items placed into service prior to the end of construction, the warranty period will continue for one year after the completion of construction. In addition to the items listed in Subsection 12.4 above, the contractor will warrant that:

* All work will be carried out according to the approved final design, using materials, equipment, goods and employing workmanship that are of the quality required in the contract documents, and
* All work will comply with all applicable laws, regulations, and industry standards.

The Project Manager will ensure that the Contractors’ warranty and guarantee obligations are met. Should the Project Manager discover or determine that a warranty or guarantee issue exists, the Project Manager will notify the Contractor and the Contractor will have no more than ten days to propose a method for correcting the problem. The Project Manager will evaluate the Contractor’s proposal and if approved will make a recommendation for its implementation to the Contracting Officer. The Contractor will then be required to perform the corrective work using the most expedient means in order to minimize operational disruption

# 13. Safety/Security

## 13.1 General Approach

The primary objective of the [insert project name] Project Safety Program is the well-being, comfort, and security of patrons, travelers, employees and the general public. This program emphasizes the early detection and elimination or mitigation of hazards and concerns during the entire lifecycle of the project, including final design, construction, testing, startup, and operations stages. This safety program will enhance and secure the Project site as well as all interfaces with the surrounding community.

The program provides for an accident and drug-free workplace; employee safety training; the use of prescribed safety equipment on the job site; construction accident reporting and corrective actions; procurement of reliable equipment; safety programs for subcontractors; safety certification checklists; accident investigations during start-up and operations; preventive and corrective maintenance procedures; surveillance of all locations by MBTA Police; supervised evacuation of patrons as required; and the coordination of emergency response from police, ambulance and fire departments.

## 13.2 Design Safety and Security

The Project Manager and design and construction Contractors will be jointly responsible for developing, implementing and maintaining a series of programs which control and preserve safety and security during the final design stages. These programs will continue into the construction and operating phases. The specific programs are:

* Fire/Life Safety and Safety Design Reviews;
* Systems Safety - Hazard Analysis;
* Systems Assurance - Reliability Availability and Maintainability; and
* Safety Certification.

The physical design of the [insert project name] will be checked and modified to ensure protection from the effects of fire and smoke; ease of vehicular and pedestrian approach and egress; elimination of vehicular and pedestrian blind spots, dead ends, or dangerous intersections; adequate lighting; security surveillance by camera and security personnel; backup power supplies; and compliance with the Americans with Disabilities Act.

The design and construction Contractors will be responsible for submitting Systems Safety Programs which are comprised of various hazard analyses including preliminary, fault and interface studies. Any system wide hazard or those that could result in serious injury will be compiled into a Catastrophic/Critical Items List. These identified safety and security hazards will be eliminated or minimized by design measures or through the use of safety devices or procedures. System Safety Programs will also include a Hazard Reporting System and the submission of Test Plans which will verify the effectiveness of the design with respect to safety and security during the startup phases of the Project.

The [insert project name] Project’s facilities will be designed using only proven methods and equipment. The design will emphasize the use of interchangeable modular components and the use of redundant, fail-safe systems whenever possible.

A Safety Certification Program managed jointly by the Project Manager and the design and construction Contractors will assure that all safety related requirements have been correctly translated into design criteria, specifications, drawings, calculations and sub-tier submittals, and eventually the installed condition. Safety-related requirements are extracted from design criteria and specifications. These requirements are compiled into checklists for each contract. Every checklist item such as a test report or certificate of conformance must be satisfactorily completed before operations commence.

The [insert project name] Project’s construction site shall comply with all requirements of the Federal Occupational Safety and Health Act of 1970, the MBTA’s safety regulations and all local laws, ordinances and regulations. To verify compliance with federal and local requirements, the construction Contractors will submit Construction Site Safety Programs.

These programs specify that Contractors assign Safety and Security managers; define interfaces and responsibilities of key personnel; and possess written procedures which control the work site operations. Further program requirements include the formation of an Emergency Response Team; safety and security drills; participation in the Fire/Life Safety Committee; classroom training and certification of staff in safety and security matters; hazard identification and elimination at construction sites; accident reporting systems; substance abuse program; sub-tier safety programs; and periodic audits by the local fire department.

Safety and security equipment employed at the sites includes entry barriers, perimeter fencing, alarms, exterior lighting, identification badges, warning signs, helmets, footwear, eye goggles, ear protection, safety harnesses, lifelines, gloves, knee pads, belts, respirators, fluorescent garments and foul weather gear.

The Project will comply voluntarily with all municipal requirements for a site safety project. The Project Manager will retain the services of a Site Safety Manager to oversee the Contractor’s compliance with the Contractor’s safety programs.

## 13.3 Protection of MBTA Operations during Construction

In general, all of the subways/railroads will be in continuous operation throughout the performance of the construction work. The railroads affected by the project include MBTA [insert name of lines affected]. The safety and continuity of the railroads’ operation will be of primary importance.

Where the project includes work across, over, under, or adjacent to active railroad tracks or railroad right-of-way, the contractor will safeguard the traffic, tracks, and appurtenances, and other railroad property affected by its work. Construction will be scheduled and executed in a manner that will enable each of the railroads to maintain its full level of scheduled service to the fullest extent possible.

The contractors will be required to submit for approval, plans, computations, a detailed description of the construction procedures, and a schedule for accomplishing the work, including methods of protecting railroad traffic.

Contractors’ employees working on the project will be required to attend a railroad and/or MBTA safety training class. All personnel will comply with the rules and regulations and safety requirements of the respective railroads throughout the project.

During the construction phase, the construction contractors will develop, maintain, and implement a plan of operations for maintaining and protecting all passenger and pedestrian operations, concessions, services, and flows. This plan will include working drawings showing the placement of barricades and barriers as well as a detailed narrative describing how the plan is to be implemented and how passengers and pedestrians will receive advisories regarding routings and detours. This plan will also include information on the location and installation of temporary directional signs. The plan will be coordinated with all system and utility work plans. TV monitors, public address speakers, signs, and public telephones will be placed in specific, affected areas.

# 14. Interagency Coordination

Effective coordination between participating agencies will be an important on-going activity on the project. This section addresses the coordination process through the discussion of the following key areas:

* Interagency Agreements with Utility Providers
* Tracking Interagency Inputs
* Agreements with City and State Agencies
* Protection of the MBTA Operations During Construction
* Impact Mitigation
* Easement Agreement

## 14.1 MBTA Interagency Agreements with Utility Providers

MBTA will enter into Cooperative and Force Account agreements with other agencies and utility providers for the project. These agreements will provide the legal framework for the project and the owners of the affected areas to identify, plan, design, rearrange, and construct facilities in the most cost-effective manner. The agreements will also provide the basis for identifying the scope of work; developing cost estimates; issuing work orders; and authorizing costs and betterment credits, if applicable, and method of payment. They will also define the parties responsible for executing the documented tasks associated with the agreements and the funding source.

During the Preliminary Engineering design phase, the Design Team will coordinate with utility providers to develop preliminary plans for the rearrangement of the affected utilities and integrate these proposals with project plans. Utility and agency representatives will be included in kick-off discussions for each construction contract and develop schedules for rearrangement of impacted facilities.

During the Final Design phase, the Team will coordinate with utility providers to develop detailed plans for facility rearrangements and integrate these plans into the construction contract documents. Utility and agency representatives will be included in kick-off discussions for each construction contract and develop schedules for rearrangement of the impacted facilities.

The Design Team will coordinate the utility design with the [insert project name] Project design team during the Project.

The major utility providers include:

* [list utility]
* [list utility]
* [list utility]
* [list utility]

## 14.2 Tracking Interagency Inputs

The Team will develop a master list of all involved agencies that require deliverables whether it is for the approval of designs or the development and approval of the permits necessary to maintain the project’s progress. A list of contacts within the various relevant agencies or within the departments of the same agency will be developed. This will ensure that a comprehensive list of existing and planned future contacts is produced. Based upon review of the list, an initial contact will be established via letter and meetings, as appropriate, for each phase of the project. Based upon the initial contacts, required signoffs; deliverables; and approvals for each department or agency will be identified and coordinated with a master project schedule.

## 14.3 Agreements with City and State Agencies and Authorities

The project will establish procedures for [City/Town] (City) services and the relocation of City facilities impacted by construction. The procedures will secure the city’s assistance to the project in the areas of public works engineering, hazardous waste control, traffic engineering, and fire safety. Police services will be provided by the MBTA Transit Police. The following are the major City agencies:

* Department of Public Works;
* Police Department (Coordination with the [City/Town] Police will be through the MBTA Transit Police);
* Fire Department; and
* Office of Strategic Planning and Community Development.