Massachusetts Bay Transportation Authority

Design & Construction Department

Lessons Learned Management Response: Design

Compiled By Project Controls

Lessons Learned Management Response - Design

I.D. #	Item No.	Classification	Brief Description	Recommendation	Management Brief Action Plan
D.BR12.1	1	Bridge	in-depth bridge design review	MBTA dept. to conduct a detailed tech. review at 60% design	where suitable expertise is not available in-house, seek outside resources
	2	Bridge		or conduct independent tech. review at 60% through a task order	where suitable expertise is not available in-house, seek outside resources
D.BR12.2	1	Bridge	lack of updated drawings from signal dept.	hire signal consultant to identify and test existing system for every transit bridge project	include in scope of work of Designer
D.BR12.3	1	Bridge	temp. facility coordination	determine stakeholder requirements early in design for temp. conditions	when doing Design-Build there should be an extra effort during preliminary design to engage other depts; insist on outside entities to follow Project Controls Manual & Project Managers Manual
D.BR12.4	1	Bridge	accelerated bridge construction methods	incorporate Accelerated Bridge practices, such as Fast 14, into future design projects	all bridges should consider Accelerated Bridge methods; during PDG meetings this will be vetted

Lessons Learned Management Response - Design

I.D. #	Item No.	Classification	Brief Description	Recommendation	Management Brief Action Plan
D.BR12.5	1	Bridge	include bridge expections in all bridge projects	during design, bridge inspections should be done continuously throughout the design by the design engineer and not by the typical bridge inspection consultant	frequent inspections need to occur; there is a program instituted, it needs to be followed; a decision on who needs to do inspections should be on a case by case basis
D.CR12.1	1	Commuter Rail	design delay	determine stakeholder requirements during feasibility and planning stage	document community meetings; Designers should provide meeting minutes
D.CR12.2	1	Commuter Rail	defining subconsultant scope of work	identify scope of subconsultant work and obtain MBTA license requirements	T should obtain design schedule that details the entire scope of work
	2			perform scope early to avoid undue delays	T should obtain design schedule for monitoring and tracking progress
D.CR12.3	1	Commuter Rail	identify external impact on design review from Amtrak	determine stakeholder requirements, i.e. Amtrak, MBCR	at 30% confirm stakeholders and requirements/concerns
	2			request cost for P.I.'s in early stage of design development	at 60% submittal show evidence of Designer confirming order of magnitude; get agreement on scope and cost at 90%

Lessons Learned Management Response - Design

I.D. #	Item No.	Classification	Brief Description	Recommendation	Management Brief Action Plan
D.EL12.1	1	Elevator	changing design criteria for replacement elevators	engage stakeholders and notify them of cost and schedule increases to determine acceptance for compliance with new criteria for existing systems	needs to be part of standard spec. review process; utilize standard spec review process for any technical changes.
D.EL12.2	1	Elevator	early communication and buy-in from stakeholder of design criteria for replacement elevators	engage stakeholders and notify them of cost and schedule increases to determine acceptance for compliance with new criteria for existing systems	needs to be part of standard spec. review process; utilize standard spec review process for any technical changes.
D.LR12.1	1	Light Rail Right-of-way	changes to designer scope	decisions were made in order to keep project moving, later adjustments were needed and justified	Agree
D.MF12.1	1	Maintenance Facility Improvement	buried utility clearance	notify all MBTA stakeholders of impending borings	Agree; signoff from T internal dept. (i.e., power); require designer to get submittal requests 30 days prior; PM should visit site with affected dept. before drilling allowed
	2			request info for known utilities	same as above

Lessons Learned Management Response - Design

I.D. #	Item No.	Classification	Brief Description	Recommendation	Management Brief Action Plan
	3			require ground penetrating radar (GPR) findings prior to excavations/borings	consider use on a case by case basis in addition to test pitting; vaccum excavation and other subsurface investigation methods
	4			perform job hazard analysis	Agree; should be performed by drilling contractor; Safety Committee to develop a standard JHA form
D.MF12.2	1	Maintenance Facility Improvement	coordination with MBTA D&C and E&M for immediate response to safety concerns	timely response to safety related issues/concerns is a must for all projects	develop a procedure for response to emergencies which include proper procurement and include in Project Managers Manual
D.NC12.1	1	New Capital Expansion	coordination with MBTA departments	maintain updated MBTA Org. Chart for the purpose of correct info distribution	Project Controls will develop RACI chart; Org Chart will be maintained by Contract Admin.
D.NV12.1	1	New Vertical Construction	periodic reports	more project reporting between consultants and T prior to design milestones to confirm scope, expectations and progress	this is a PM function; PM's are required to be in constant communication with their Designers and follow Project Controls Manual & Project Managers Manual
D.PL12.1	1	Parking Lot	scope increases	in order to mitigate scope creep, skip a stage of design deliverable	consider on a case by case basis; assess scope increases and determine whether or not to facilitate and accept schedule impact, if possible.

Lessons Learned Management Response - Design

I.D. #	Item No.	Classification	Brief Description	Recommendation	Management Brief Action Plan
D.PL12.2	1	Parking Lot	negotiated fixed fee for design services	Contract Administration should state Negotiated Fixed Fee in contracts to Consultants	management has issued a bulletin, will be meeting with ACEC in December to resolve
	2			track and monitor Negotiated Fee for each approved action	project manager should review invoices carefully
	3			require Consultants to bill consistent with Negotiated Fee	all PM's need to be reviewing invoices; see Contract Admin to perform an audit; for Consultants found to be inconsistent, their evaluation will be impacted
D.PL12.3	1	Parking Lot	soil and site history investigation	perform mininum of 2 soil boring samples to identify soil conditions, prior to 30% design	include requirement in RFP as a scope item; do historical evalution before 30%
	2			require designer to obtain Sanborn maps for historical purposes prior to 30%	include requirement in RFP as a scope item; do historical evalution before 30%
D.SI12.1		System Improvement	equipment for Consultant Design Inspection Contracts	T needs to cease the practice of providing designers with inspection equipment, such as Hi-Rail and man-lifts	coordinate with D&C to get equipment, if not, designer needs to provide; change design and inspection contract to make designers responsible

Lessons Learned Management Response - Design

I.D. #	Item No.	Classification	Brief Description	Recommendation	Management Brief Action Plan
D.SR12.1	1	Station Renovation	fast track design build	better define scope and when scope definition is not possible, make sure to include high contingency for cost and schedule	add language to Project Controls Manual or the PM Manual that discusses extreme cases; or add "or as budget dictates"
	2			for fast track projects coordinate with Contract Admin. very early on	Agree
D.SR12.2	1	Station Renovation	accessibility solicitation for design services	MBTA SWA office should review solicitations prior to issuance of RFP	ensure adherance to accessibility review for all T projects issued 5-17-2010; will be included in Project Manager's Manual

DESIGN

BRIDGE

D.BR12.1

Lessons Learned Form

QTR. 20 12

- [x] 1. Jan. - Mar.
- [ ] 2. Apr. - June
- [ ] 3. Jul. - Sept.
- [ ] 4. Oct. - Dec.

1. Project Title: Draw 1 (North Station) Drawbridge Replacement
2. Contract #: B92PS07
3. Lessons Learned #: 1
4. Date: 2/5/2012
5. Project Delivery Method
   - [x] Design - Bid - Build
   - [ ] Design Build
   - [ ] CM @ Risk
6. Phase:
   - [ ] Conceptual Design of 15%
   - [x] Preliminary Design 15% - 60%
   - [ ] Final Design 60% - 100%
   - [ ] Procurement
   - [ ] Construction

7. Project Classification:

☐	System Improvement	☐	Maintenance Facility Improvement
☐	Parking Lot	☐	New Elevator
☐	Roadway	☐	Replacement Elevator
☐	Commuter Rail	☐	Parking Garage
☑	Bridge	☐	Light Rail Right-of-Way
☐	Station Renovation	☐	New Vertical Construction
☐	New Capital Expansion	☐	Environmental
☐	Noise Wall	☐	Heavy Civil
☐	Building Demo	☐	Signal/Comm./Power

8. Lessons Learned Affected Category:

☐	Scope	☐	Time
☐	Cost	☑	Management

9. Is this a safety related lesson? ☐ Yes ☑ No

10. Title of Lessons Learned: Design Review

11. Background:

The current MBTA guidelines require that design submittals for bridge projects be reviewed internally at the 15%, 30%, 60%, 90% and 100% design stages (see Chapter 5, Project Manager's Manual 10-01-11). The review is expected to cover key elements of the design such as structural, mechanical, electrical, signal, environmental and constructability, among others. For review to occur, the PM is required to send the design submittal to the relevant MBTA departments for review. A set of additional reviews are also required: Value Engineering (30%), Constructability (60%) and Peer Review (100%).

12. Lessons Learned Challenges (what needs improvement or what went well?):

The Design Review comments received from the MBTA reviewing departments for the North Station Drawbridge 60% design will suggest an incomplete review. It appears that a detailed technical review of the design, estimate, specification and compliance with Design Standards for the Structural, Mechanical, Electrical and Signal components is missing. Whilst the Peer review conducted at the 100% design stage may cover these elements, it may be too late or costly to address design errors. Even if the Consultant is responsible for costs, the schedule delay (and associated funding implications) may be unacceptable.

13. Lessons Learned Recommendations (how would you improve or avoid or why do you think it went so well?):

It is recommended that:
1. MBTA departments conduct a detailed technical review of design submittals covering structural, mechanical, electrical and signals (at least at the 60% design stage) OR;
2. D&C should conduct a design Peer Review through an independent consultant retained by the MBTA at the 60% design stage, provided the review covers these elements.

14. Applicability:

All Bridge Replacement Projects.
All Bridge Refurbishment Projects requiring replacement of a substantial proportion of the structural elements

Submitted by: Bashir Madamidola P.E.

Telephone #: 617-222-4558 Email: bmadamidola@mbta.com

Lessons Learned Form

QTR. 3 - 2011

☐ 1. Jan. - Mar. ☐ 3. Jul - Sept
☐ 2. Apr. - June ☐ 4.**Oct. - Dec.**

1. Project Title: Design for the rehabilitation of Twelve Bridges System-wide_

2. Contract #: B92PS09_____

3. Lessons Learned #: No. 1_

4. Date: December 2011_____

5. Project Delivery Method

   ☐ **Design - Bid - Build**
   ☐ Design Build
   ☐ CM @ Risk

6. Phase:

   ☐ Conceptual Design of 15%
   ☐ Preliminary Design 15% - 60%
   ☐ **Final Design 60% - 100%**
   ☐ Procurement
   ☐ Construction

7. Project Classification:

   ☐ System Improvement
   ☐ Parking Lot
   ☐ Roadway
   ☐ Commuter Rail
   ☐ **Bridge**
   ☐ Station Renovation
   ☐ New Capital Expansion
   ☐ Noise Wall
   ☐ Building Demo
   ☐ Maintenance Facility Improvement
   ☐ New Elevator
   ☐ Replacement Elevator
   ☐ Parking Garage
   ☐ Light Rail Right-of-Way
   ☐ New Vertical Construction
   ☐ Environmental
   ☐ Heavy Civil
   ☐ Signal/Comm./Power

8. Lessons Learned Affected Category:

   ☐ **Scope** ☐ **Time**
   ☐ **Cost** ☐ Management

9. Is this a safety related lesson? ☐ Yes ☐ **No**

10. Title of Lessons Learned: It was an awakening on the lack of information that Signals Department had of their system details and the necessity to map and test the cables

11. Background: Based on meetings held with Signal Department from the start of the project, the contract drawings identified a certain methodology for the replacement of the Power and Signal Cables. We had received drawings from Power Division and very limited information from Signal Division. The bridge drawings had reached 90% when the dreaded information was passed on to us that we need to hire a signal consultant to identify and test the active signal cables in the field. As suggested by Signals Department, the sub consultant was brought on board and testing was completed in couple of months. Drawings were prepared which identified the working cables both to the north and south of the bridge. Power and Signals are reviewing the drawings at this point. This has caused the project additional cost and time.

12. Lessons Learned Challenges (what needs improvement or what went well?): Knowing the reality now, it is important to have a signal consultant for every transit bridge project, from the start.

13. Lessons Learned Recommendations (how would you improve or avoid or why do you think it went so well?): Follow recommendation in Item 12 to avoid the same issue for future projects.

14. Applicability: It is important to have a signal sub consultant to handle systems on transit bridge projects.

Submitted by: Elizabeth Ozhathil, P.E.

Telephone #: 617-222-5112 Email: eozhathil@mbta.com

D:BR12.3

Lessons Learned Form

QTR. 20 11

- [ ] 1. Jan. - Mar.
- [ ] 3. Jul. - Sept.
- [ ] 2. Apr. - June
- [x] 4. Oct. - Dec.

1. Project Title: Revere Transit Facility and Streetscape Project
2. Contract #: D39CN01
3. Lessons Learned #:
4. Date: 1/10/2012
5. Project Delivery Method
   - [ ] Design - Bid - Build
   - [x] Design Build
   - [ ] CM @ Risk
6. Phase:
   - [ ] Conceptual Design of 15%
   - [ ] Preliminary Design 15% - 60%
   - [x] Final Design 60% - 100%
   - [ ] Procurement
   - [ ] Construction

7. Project Classification:

☐ System Improvement	☐ Maintenance Facility Improvement
☐ Parking Lot	☐ New Elevator
☐ Roadway	☐ Replacement Elevator
☐ Commuter Rail	☐ Parking Garage
☑ Bridge	☐ Light Rail Right-of-Way
☐ Station Renovation	☐ New Vertical Construction
☐ New Capital Expansion	☐ Environmental
☐ Noise Wall	☐ Heavy Civil
☐ Building Demo	☐ Signal/Comm./Power

8. Lessons Learned Affected Category:

☐ Scope	☑ Time
☑ Cost	☐ Management

9. Is this a safety related lesson? ☐ Yes ☑ No

10. Title of Lessons Learned: Temporary facility coordination

11. Background:

The project involves constructing an elevated walkway between Wonderland Station and Revere Beach; this walkway will be built over an existing MBTA customer parking lot and busway. A temporary busway and reconfiguration of the lot was required to create a footprint for the project and laydown space for the contractor. The work was part of a design/build contract - a minimal effort at development of the temporary design was made during the preliminary design phase, with the assumption that the contractor would provide a more complete design reflecting their needs for working space for the project.

12. Lessons Learned Challenges (what needs improvement or what went well?):

Once the temporary lot was nearing completion, parking and real estate identified several additional changes they wanted. The changes were not a problem technically and appeared relatively minor, but a change order of around $40,000 will be required. Had the proposed design been better understood by all prior to going out to bid, the costs would have been absorbed into the original bid.

13. Lessons Learned Recommendations (how would you improve or avoid or why do you think it went so well?):

Better communication of the needs of parking and of the proposed design would probably have minimized the changes. As a design/build project, not enough attention was paid to the design during preliminary design (prior to awarding the d/b contract); during final design, not enough time was spent making sure parking's needs were met. Better communication of those needs would also have been helpful.

14. Applicability:

Submitted by: TOM ROVERO

Telephone #: _____ Email: _____

D.BR12.4

Lessons Learned Form

QTR. 20 12

- [x] 1. Jan. - Mar.
- [ ] 3. Jul. - Sept.
- [ ] 2. Apr. - June
- [ ] 4. Oct. - Dec.

1. Project Title: Beverly Draw Bridge
2. Contract #: B92PS08
3. Lessons Learned #: 1
4. Date: 1/11/12
5. Project Delivery Method
   - [x] Design - Bid - Build
   - [ ] Design Build
   - [ ] CM @ Risk
6. Phase:
   - [ ] Conceptual Design of 15%
   - [x] Preliminary Design 15% - 60%
   - [ ] Final Design 60% - 100%
   - [ ] Procurement
   - [ ] Construction

7. Project Classification:

☐	System Improvement	☐	Maintenance Facility Improvement
☐	Parking Lot	☐	New Elevator
☐	Roadway	☐	Replacement Elevator
☐	Commuter Rail	☐	Parking Garage
☑	Bridge	☐	Light Rail Right-of-Way
☐	Station Renovation	☐	New Vertical Construction
☐	New Capital Expansion	☐	Environmental
☐	Noise Wall	☐	Heavy Civil
☐	Building Demo	☐	Signal/Comm./Power

8. Lessons Learned Affected Category:

☐	Scope	☑	Time
☐	Cost	☐	Management

9. Is this a safety related lesson? ☐ Yes ☑ No

10. Title of Lessons Learned: Accelerated Bridge Construction Methods

11. Background:

This bridge rehabilitation project runs along the Newburyport/Rockport Commuter Rail Route over the Danvers River.

12. Lessons Learned Challenges (what needs improvement or what went well?):

Construction time and track outages are an essential part of our bridge construction projects. We need to consider practices consisting of accelerated bridge construction methods into the design of these bridges.

13. Lessons Learned Recommendations (how would you improve or avoid or why do you think it went so well?):

Consultants should consider Accelerated Bridge practices into their design for future projects. The additional costs for these methods will benefit from the reduced construction schedule and overall impacts of train operations.

14. Applicability:

All MBTA System-wide bridges that will be replaced/rehab.

Submitted by: Ken Lim

Telephone #: 617-222-4487 Email: KLim@mbta.com

Lessons Learned Form

QTR. 20____

☐ 1. Jan. - Mar. ☐ 3. Jul. - Sept.

☐ 2. Apr. - June ☐ 4. Oct. - Dec.

1. Project Title: Repair/Rehabilitation of the Merrimack River and Washington St. Bridges

2. Contract #: B64PS01

3. Lessons Learned #: 1

4. Date: 1/9/2012

5. Project Delivery Method

- ☑ Design - Bid - Build
- ☐ Design Build
- ☐ CM @ Risk

6. Phase:

- ☐ Conceptual Design of 15%
- ☑ Preliminary Design 15% - 60%
- ☐ Final Design 60% - 100%
- ☐ Procurement
- ☐ Construction

7. Project Classification:

☐	System Improvement	☐	Maintenance Facility Improvement
☐	Parking Lot	☐	New Elevator
☐	Roadway	☐	Replacement Elevator
☐	Commuter Rail	☐	Parking Garage
☑	Bridge	☐	Light Rail Right-of-Way
☐	Station Renovation	☐	New Vertical Construction
☐	New Capital Expansion	☐	Environmental
☐	Noise Wall	☐	Heavy Civil
☐	Building Demo	☐	Signal/Comm./Power

8. Lessons Learned Affected Category:

☑	Scope	☑	Time
☐	Cost	☑	Management

9. Is this a safety related lesson? ☐ Yes ☑ No

10. Title of Lessons Learned: Include Inspections in the project Scope

11. Background:

FRA requires periodical inspections of the existing infrastructure. If the length of the project goes beyond the required time between inspections, they should be included in the Scope.

12. Lessons Learned Challenges (what needs improvement or what went well?):

A decision has to be made by the MBTA if to use the consultant on the job or to retain another one just for inspection(s).
The FRA requirements and the MBTA Bridge Management Program is useful to establish an inspection schedule and responsibilities.

13. Lessons Learned Recommendations (how would you improve or avoid or why do you think it went so well?):

Include Inspections in bridge design contracts.

14. Applicability:

All bridge project.

Submitted by: Reta Barasch

Telephone #: x 3360 Email: rbarasch@mbta.com

COMMUTER RAIL

Lessons Learned Form

QTR. 20**12**

1. Jan. - Mar. 3. Jul. - Sept.
2. Apr. - June 4. Oct. - Dec.

1. Project Title: Blue Hill Avenue Commuter Rail Static

2. Contract #: H74CN09

3. Lessons Learned #: 1

4. Date: January 12, 2012

5. Project Delivery Method

   √ Design - Bid - Build
   ☐ Design Build
   ☐ CM @ Risk

6. Phase:

   ☐ Conceptual Design of 15%
   ☐ Preliminary Design 15% - 60%
   √ Final Design 60% - 100%
   ☐ Procurement
   ☐ Construction

7. Project Classification:

   ☐ System Improvement
   ☐ Parking Lot
   ☐ Roadway
   √ Commuter Rail Station
   ☐ Bridge
   ☐ Station Renovation
   ☐ New Capital Expansion
   ☐ Noise Wall
   ☐ Building Demo
   ☐ Maintenance Facility Improvement
   ☐ New Elevator
   ☐ Replacement Elevator
   ☐ Parking Garage
   ☐ Light Rail Right-of-Way
   ☐ New Vertical Construction
   ☐ Environmental
   ☐ Heavy Civil
   ☐ Signal/Comm./Power

8. Lessons Learned Affected Category:

   √ Scope **√ Time**
   √ Cost **√ Management**

9. Is this a safety related lesson? ☐ Yes **√ No**

10. Title of Lessons Learned: Design Delay

11. Background: The Blue Hill Avenue Commuter Rail Station is part of a State Implementation Plan (SIP) mandate for environmental mitigation as part of a Federal clean Air Act for the Central Artery Project to construct four new commuter rail stations on the existing Fairmount Corridor in the urban areas of Roxbury, Dorchester and Mattapan. Design delays are directly attributed to comments made to Project Staff and electeds, by a local community group, during a 60% design presentation at a public meeting, that they did not want a station constructed in their neighborhood.

12. Lessons Learned Challenges (what needs improvement or what went well?): Project Staff had no previous knowledge of the residents' concerns; residents claim that they were never informed of the proposed location during the 2002 Feasibility Study and Planning Phase.

13. Lessons Learned Recommendations (how would you improve or avoid or why do you think it went so well?): Better coordination with all affected neighbors and abutters during the Planning Phase prior to proceeding with design.

14. Applicability: Planning Phase

Submitted by: Mark P. Czyrklis

Telephone #: 617-222-3265 Email: mczyrklis@mbta.com

Lessons Learned Form

QTR. 20 11

- [ ] 1. Jan. - Mar.
- [ ] 3. Jul. - Sept.
- [ ] 2. Apr. - June
- [x] 4. Oct. - Dec.

1. Project Title: Mansfield RR Station Accessibility Improvements
2. Contract #: Z92PS32 - Task Order 2
3. Lessons Learned #: Identifying MBTA/TRA permit/license requirements at early stage.
4. Date: January 9, 2012
5. Project Delivery Method
   - [x] Design - Bid - Build
   - [ ] Design Build
   - [ ] CM @ Risk
6. Phase:
   - [ ] Conceptual Design of 15%
   - [x] Preliminary Design 15% - 60%
   - [ ] Final Design 60% - 100%
   - [ ] Procurement
   - [ ] Construction

7. Project Classification:

☐	System Improvement	☐	Maintenance Facility Improvement
☐	Parking Lot	☐	New Elevator
☐	Roadway	☐	Replacement Elevator
☑	Commuter Rail	☐	Parking Garage
☐	Bridge	☐	Light Rail Right-of-Way
☐	Station Renovation	☐	New Vertical Construction
☐	New Capital Expansion	☐	Environmental
☐	Noise Wall	☐	Heavy Civil
☐	Building Demo	☐	Signal/Comm./Power

8. Lessons Learned Affected Category:

☑	Scope	☑	Time
☐	Cost	☐	Management

9. Is this a safety related lesson? ☐ Yes ☑ No

10. Title of Lessons Learned: Defining subconsultant scope of work

11. Background:

The project experienced undue delays in securing permits for sub consultant to perform several tasks which included test borings and test pits at the project site. Insufficient identification of soil consultant's work resulted in delays while securing approvals and permits from TRA to obtain licenses. The caused delays in completion of design work.

12. Lessons Learned Challenges (what needs improvement or what went well?):

Identifying scope of sub consultant work and MBTA/TRA license requirements, schedule etc. in during design development stage caused undue delays.

13. Lessons Learned Recommendations (how would you improve or avoid or why do you think it went so well?):

Identify scope of sub consultant work and schedule early in proposal development stage to avoid undue delays.

14. Applicability:

Future projects where similar situations, unforseen in detailed scope of work can be avoided if additional permit/license requirements are identified at early stage.

Submitted by: Mahendra Patel

Telephone #: 617-222-6756 Email: mpatel@mbta.com

D.CR12.3

Lessons Learned Form

QTR. 20 11

- [ ] 1. Jan. - Mar.
- [x] 3. Jul. - Sept.
- [ ] 2. Apr. - June
- [ ] 4. Oct. - Dec.

1. Project Title: Mansfield RR Station Accessibility Improvements
2. Contract #: Z92PS32 - Task Order 2
3. Lessons Learned #: Identifying Amtrak Design Review Requirements at early stage
4. Date: January 9, 2012
5. Project Delivery Method
   - [x] Design - Bid - Build
   - [ ] Design Build
   - [ ] CM @ Risk
6. Phase:
   - [ ] Conceptual Design of 15%
   - [x] Preliminary Design 15% - 60%
   - [ ] Final Design 60% - 100%
   - [ ] Procurement
   - [ ] Construction

7. Project Classification:

☐	System Improvement	☐	Maintenance Facility Improvement
☐	Parking Lot	☐	New Elevator
☐	Roadway	☐	Replacement Elevator
☑	Commuter Rail	☐	Parking Garage
☐	Bridge	☐	Light Rail Right-of-Way
☐	Station Renovation	☐	New Vertical Construction
☐	New Capital Expansion	☐	Environmental
☐	Noise Wall	☐	Heavy Civil
☐	Building Demo	☐	Signal/Comm./Power

8. Lessons Learned Affected Category:

☑	Scope	☑	Time
☐	Cost	☐	Management

9. Is this a safety related lesson? ☐ Yes ☑ No

10. Title of Lessons Learned: Identifying external imapact on design review from Amtrak

11. Background:

The project experienced important need of external review of design submission by Amtrak staff in addition to internal commuter rail operations and MBCR input. It required significant coordination and needed an estimate of force account from Amtrak to execute a PI agreement to facilitate the review of project design by Amtrak.

12. Lessons Learned Challenges (what needs improvement or what went well?):

Identifying scope of additional reviews by external parties such as Amtrak during design development is very important and critical to the overall project schedule and cost.

13. Lessons Learned Recommendations (how would you improve or avoid or why do you think it went so well?):

Review the commuter rail road station project scope in detail and identify if there is impact with Amtrak operations and facilities at early stage and request costs for PI agreement at early stage of project.

14. Applicability:

Future RR Station projects with similar situations involving Amtrak review of design and plans can plan accordingly and improve the design development schedule.

Submitted by: Mahendra Patel

Telephone #: 617-222-6756 Email: mpatel@mbta.com

ELEVATOR

D.EL12.1

Lessons Learned Form

QTR. 20 11

- [ ] 1. Jan. - Mar.
- [ ] 3. Jul. - Sept.
- [ ] 2. Apr. - June
- [x] 4. Oct. - Dec.

1. Project Title: Elevator Replacements System wide
2. Contract #: S41PS02
3. Lessons Learned #: 1
4. Date: 1/11/2012
5. Project Delivery Method
   - [x] Design - Bid - Build
   - [ ] Design Build
   - [ ] CM @ Risk
6. Phase:
   - [ ] Conceptual Design of 15%
   - [x] Preliminary Design 15% - 60%
   - [ ] Final Design 60% - 100%
   - [ ] Procurement
   - [ ] Construction

7. Project Classification:

☐	System Improvement	☐	Maintenance Facility Improvement
☐	Parking Lot	☐	New Elevator
☐	Roadway	☑	Replacement Elevator
☐	Commuter Rail	☐	Parking Garage
☐	Bridge	☐	Light Rail Right-of-Way
☐	Station Renovation	☐	New Vertical Construction
☐	New Capital Expansion	☐	Environmental
☐	Noise Wall	☐	Heavy Civil
☐	Building Demo	☐	Signal/Comm./Power

8. Lessons Learned Affected Category:

☑	Scope	☑	Time
☑	Cost	☐	Management

9. Is this a safety related lesson? ☐ Yes ☑ No

10. Title of Lessons Learned: Changing Design Criteria for Replacement Elevators

11. Background:

The updated MBTA Elevator Design Standards and Specifications were completed on May 24, 2011 and August 2, 2011, respectively.

The updated elevator design standards require approval from the MBTA Office of System wide Accessibility (SWA) and System wide Maintenance for departures from the standards. For the replacement elevator program, the Project expects that the existing conditions will not be conducive to meeting all the new requirements.

12. Lessons Learned Challenges (what needs improvement or what went well?):

The SWA concurrence under the S41PS03 contract was successful when the Project team quantified the cost and schedule increases for a larger replacement elevator cab size at the Tufts and Andrew Stations.

13. Lessons Learned Recommendations (how would you improve or avoid or why do you think it went so well?):

It seems that the best way to engage MBTA stakeholders is to provide the cost and schedule increases for compliance with new criteria for existing systems.

14. Applicability:

All replacement elevators.

Submitted by: Marjorie B. Madden

Telephone #: 617 222 3797 Email: mmadden@mbta.com

D.EL12.2

Lessons Learned Form

QTR. 20 11

- [ ] 1. Jan. - Mar.
- [ ] 3. Jul. - Sept.
- [ ] 2. Apr. - June
- [x] 4. Oct. - Dec.

1. Project Title: Replacement Elevators at Tufts Medical Center and Andrew Stations
2. Contract #: S41PS03
3. Lessons Learned #: 1
4. Date: 1/11/2012
5. Project Delivery Method
   - [x] Design - Bid - Build
   - [ ] Design Build
   - [ ] CM @ Risk
6. Phase:
   - [ ] Conceptual Design of 15%
   - [ ] Preliminary Design 15% - 60%
   - [x] Final Design 60% - 100%
   - [ ] Procurement
   - [ ] Construction

7. Project Classification:

☐	System Improvement	☐	Maintenance Facility Improvement
☐	Parking Lot	☐	New Elevator
☐	Roadway	☑	Replacement Elevator
☐	Commuter Rail	☐	Parking Garage
☐	Bridge	☐	Light Rail Right-of-Way
☐	Station Renovation	☐	New Vertical Construction
☐	New Capital Expansion	☐	Environmental
☐	Noise Wall	☐	Heavy Civil
☐	Building Demo	☐	Signal/Comm./Power

8. Lessons Learned Affected Category:

☑	Scope	☑	Time
☑	Cost	☐	Management

9. Is this a safety related lesson? ☐ Yes ☑ No

10. Title of Lessons Learned: Changing Design Criteria for Replacement Elevators

11. Background:

MBTA SWA comments to the 90% design documents required larger replacement elevator cabs with wider doors. The design team spent an inordinate amount of time to show that the existing hoistways can not accommodate larger replacement elevators.

The Project team evaluated the hoist way conditions, looked into adjusting the elevator cab rails and relocating or steam lining mechanical operating components etc.

Repeatedly, the Project team confirmed and reported that the existing hoistways could not accommodate larger replacement elevators.

12. Lessons Learned Challenges (what needs improvement or what went well?):

The Project team decided to estimate the construction cost and duration to provide new hoistways that can accommodate larger replacement elevator cabs with wider doors. Also, because the new hoistways would extend the construction durations for the replacement elevator program, the Project team noted the extended inconvenience to customers needing accessibility accommodations and the added construction disruptions introduced at the Stations.

The Office of SWA agreed with the Project that the adverse impacts due to new hoistways outweighed the few inches gained for the replacement elevator cab sizes.

13. Lessons Learned Recommendations (how would you improve or avoid or why do you think it went so well?):

It seems that the best way to engage MBTA stakeholders is to provide the cost and schedule increases for compliance with new criteria for existing systems.

This approach will be used to present the cost and schedule increases to the replacement elevator program resulting from the updated MBTA Elevator Design Standards and Specifications.

14. Applicability:

All replacement elevators.

Submitted by: MARJORIE B. MADDEN

Telephone #: 617 222-3797 Email: mmadden@mbta.com

LIGHT RAIL RIGHT-OF-WAY

D.LR12.1

Lessons Learned Form

QTR. 20 12

- [ ] 1. Jan. - Mar.
- [ ] 2. Apr. - June
- [ ] 3. Jul. - Sept.
- [x] 4. Oct. - Dec.

1. Project Title: Boston College Station
2. Contract #: Z92PS44
3. Lessons Learned #: 1
4. Date: 1/4/2012
5. Project Delivery Method
   - [ ] Design - Bid - Build
   - [ ] Design Build
   - [ ] CM @ Risk
6. Phase:
   - [x] Conceptual Design of 15%
   - [x] Preliminary Design 15% - 60%
   - [ ] Final Design 60% - 100%
   - [ ] Procurement
   - [ ] Construction

7. Project Classification:

☐ System Improvement	☐ Maintenance Facility Improvement
☐ Parking Lot	☐ New Elevator
☐ Roadway	☐ Replacement Elevator
☐ Commuter Rail	☐ Parking Garage
☐ Bridge	☑ Light Rail Right-of-Way
☐ Station Renovation	☐ New Vertical Construction
☐ New Capital Expansion	☐ Environmental
☐ Noise Wall	☐ Heavy Civil
☐ Building Demo	☐ Signal/Comm./Power

8. Lessons Learned Affected Category:

☑ Scope	☐ Time
☐ Cost	☐ Management

9. Is this a safety related lesson? ☐ Yes ☑ No

10. Title of Lessons Learned:_____

11. Background:

Jacobs Engineer was hired to deliver a 60% design and NEPA review.

A month into the design effort, a decision was made to stop Jacobs at 30% and NEPA review. This decision was based upon a lack of funding to proceed beyond 60% design, and the fact that if we are going to procure design services, that procurement would be more effective as a 60% to Final Design/CPS package.

12. Lessons Learned Challenges (what needs improvement or what went well?):

We took the scope and costs for the 30% to 60% portion out of Jacob's overall proposal and agreed on the remaining scope and balance as the required level of effort for a 30% design and NEPA Review.

The move could have been disruptive but the transition was handled smoothly by all parties and work has progressed on track.

13. Lessons Learned Recommendations (how would you improve or avoid or why do you think it went so well?):

Decisions were made in order to get this project moving. Later adjustments were needed and justified.

14. Applicability:

Submitted by: Curtis Nikitas

Telephone #: x4792 Email: cnikitas@mbta.com

MAINTENANCE FACILITY IMPROVEMENT

D.MF12.1

Lessons Learned Form

QTR. 20____

- [ ] 1. Jan. - Mar.
- [x] 3. Jul. - Sept.
- [x] 2. Apr. - June
- [x] 4. Oct. - Dec.

1. Project Title: Everett Slab Repairs
2. Contract #: Z92PS44, Task Order 7
3. Lessons Learned #: 1
4. Date: 1/23/2012
5. Project Delivery Method
   - [x] Design - Bid - Build
   - [ ] Design Build
   - [ ] CM @ Risk
6. Phase:
   - [x] Conceptual Design of 15%
   - [ ] Preliminary Design 15% - 60%
   - [ ] Final Design 60% - 100%
   - [ ] Procurement
   - [ ] Construction

7. Project Classification:

☐	System Improvement	☑	Maintenance Facility Improvement
☐	Parking Lot	☐	New Elevator
☐	Roadway	☐	Replacement Elevator
☐	Commuter Rail	☐	Parking Garage
☐	Bridge	☐	Light Rail Right-of-Way
☐	Station Renovation	☐	New Vertical Construction
☐	New Capital Expansion	☐	Environmental
☐	Noise Wall	☐	Heavy Civil
☐	Building Demo	☐	Signal/Comm./Power

8. Lessons Learned Affected Category:

☐	Scope	☑	Time
☑	Cost	☑	Management

9. Is this a safety related lesson? ☑ Yes ☐ No

10. Title of Lessons Learned: Buried Utility Clearance

11. Background:

On May 5, 2011 the Project was notified that work for geotechnical borings began before the locating utilities in and around the Everett Main Bus Repair Building. As a result, within minutes of starting to bore the electrical feed for the building was hit.

12. Lessons Learned Challenges (what needs improvement or what went well?):

On April 1, 2011, the Project required a utility clearance using GPR in and around the proposed boring locations. The Project was awaiting the findings. The Consultant authorized borings to start before the results of the GPR were available and without any advance notice to the Project.

13. Lessons Learned Recommendations (how would you improve or avoid or why do you think it went so well?):

To prevent this recurrence, the Project will notify all MBTA stakeholders of the impending borings, request information for known utilities in the area and make access to the MBTA property for borings be part of the job hazard analysis.

Further, the Project will require GPR findings as a pre-requisite to scheduling the start of work and part of the job hazard analysis.

14. Applicability:

All site explorations on the MBTA property.

Submitted by: Marjorie B. Madden

Telephone #: 617 222 3797 Email: mmadden@mbta.com

Lessons Learned Form

QTR. 20 11

- [ ] 1. Jan. - Mar.
- [ ] 2. Apr. - June
- [ ] 3. Jul. - Sept.
- [x] 4. Oct. - Dec.

1. Project Title: Sheet Pile Retaining Wall at Charlestown
2. Contract #: Z92PS44, Task Order 11
3. Lessons Learned #: 1
4. Date: 1/11/2012
5. Project Delivery Method
   - [x] Design - Bid - Build
   - [ ] Design Build
   - [ ] CM @ Risk
6. Phase:
   - [x] Conceptual Design of 15%
   - [ ] Preliminary Design 15% - 60%
   - [ ] Final Design 60% - 100%
   - [ ] Procurement
   - [ ] Construction

7. Project Classification:

☐ System Improvement	☑ Maintenance Facility Improvement
☐ Parking Lot	☐ New Elevator
☐ Roadway	☐ Replacement Elevator
☐ Commuter Rail	☐ Parking Garage
☐ Bridge	☐ Light Rail Right-of-Way
☐ Station Renovation	☐ New Vertical Construction
☐ New Capital Expansion	☐ Environmental
☐ Noise Wall	☐ Heavy Civil
☐ Building Demo	☐ Signal/Comm./Power

8. Lessons Learned Affected Category:

☐ Scope	☐ Time
☐ Cost	☑ Management

9. Is this a safety related lesson? ☑ Yes ☐ No

10. Title of Lessons Learned: Collaboration between MBTA Design and Construction and E&M for Immediate Response to Safety Concerns

11. Background:

On September 29, 2011, Jacobs Engineering Group, Inc. (Jacobs) transmitted a report that provided an assessment, repair recommendations and probable construction costs for the deteriorated sheet pile retaining wall at the Charlestown Bus Maintenance Facilities.

Further, Jacobs recommended that employee parking in the area is restricted to 20 feet away from the retaining wall and requested that fencing is installed around sinkholes.

12. Lessons Learned Challenges (what needs improvement or what went well?):

MBTA E&M installed temporary fencing to meet the Jacobs recommendations.

13. Lessons Learned Recommendations (how would you improve or avoid or why do you think it went so well?):

The E&M timely response supports that safety is taken seriously.

14. Applicability:

All imminent safety concerns on the property.

Submitted by: Marjorie B. Madden

Telephone #: 617 222 3797 Email: mmadden@mbta.com

NEW CAPITAL EXPANSION

D.NC12.1

Lessons Learned Form

QTR. 20 11

- [ ] 1. Jan. - Mar.
- [ ] 3. Jul. - Sept.
- [ ] 2. Apr. - June
- [x] 4. Oct. - Dec.

1. Project Title: Green Line Extension
2. Contract #: E22PS02
3. Lessons Learned #: 1
4. Date: 1/23/2012
5. Project Delivery Method
   - [ ] Design - Bid - Build
   - [x] Design Build
   - [ ] CM @ Risk
6. Phase:
   - [ ] Conceptual Design of 15%
   - [x] Preliminary Design 15% - 60%
   - [ ] Final Design 60% - 100%
   - [ ] Procurement
   - [ ] Construction

7. Project Classification:

☐	System Improvement	☐	Maintenance Facility Improvement
☐	Parking Lot	☐	New Elevator
☐	Roadway	☐	Replacement Elevator
☐	Commuter Rail	☐	Parking Garage
☐	Bridge	☐	Light Rail Right-of-Way
☐	Station Renovation	☐	New Vertical Construction
☑	New Capital Expansion	☐	Environmental
☐	Noise Wall	☐	Heavy Civil
☐	Building Demo	☐	Signal/Comm./Power

8. Lessons Learned Affected Category:

☐	Scope	☐	Time
☐	Cost	☑	Management

9. Is this a safety related lesson? ☐ Yes ☑ No

10. Title of Lessons Learned: Coordination with MBTA departments

11. Background:

Consultants and Design & Construction project staff must coordinate design issues and PDG and Design Review meetings with many different departments within the MBTA. Absent current departmental organizational charts, these coordination efforts become more difficult when there are senior leadership changes within these departments.

12. Lessons Learned Challenges (what needs improvement or what went well?):

Dissemination of information relating to personnel changes within departments should be improved.

13. Lessons Learned Recommendations (how would you improve or avoid or why do you think it went so well?):

MBTA departments should update their organizational charts when changes occur. These updates should be shared within the MBTA, and Design & Construction should in turn maintain a comprehensive invitee list for PDG and Design Review meetings.

14. Applicability:

This lessons learned is applicable to all design and construction projects.

Submitted by: Jeffrey Sarin

Telephone #: 617-222-3079 Email: jsarin@mbta.com

NEW VERTICAL CONSTRUCTION

D.NV12.1

Lessons Learned Form

QTR. 20____

☐ 1. Jan. - Mar. ☐ 3. Jul. - Sept.

☐ 2. Apr. - June ☐ 4. Oct. - Dec.

1. Project Title: Hingham - New Intermodal Center

2. Contract #: Z92PS27

3. Lessons Learned #: 1

4. Date: 01/09/2012

5. Project Delivery Method

- ☑ Design - Bid - Build
- ☐ Design Build
- ☐ CM @ Risk

6. Phase:

- ☐ Conceptual Design of 15%
- ☐ Preliminary Design 15% - 60%
- ☑ Final Design 60% - 100%
- ☐ Procurement
- ☐ Construction

7. Project Classification:

☐ System Improvement	☐ Maintenance Facility Improvement
☐ Parking Lot	☐ New Elevator
☐ Roadway	☐ Replacement Elevator
☐ Commuter Rail	☐ Parking Garage
☐ Bridge	☐ Light Rail Right-of-Way
☐ Station Renovation	☑ New Vertical Construction
☐ New Capital Expansion	☐ Environmental
☐ Noise Wall	☐ Heavy Civil
☐ Building Demo	☐ Signal/Comm./Power

8. Lessons Learned Affected Category:

☐ Scope	☑ Time
☑ Cost	☐ Management

9. Is this a safety related lesson? ☐ Yes ☑ No

10. Title of Lessons Learned: periodic reports

11. Background:

It is useful that the consultant reports to the 'project' periodically between submittals. Some mistakes or misunderstandings shown in the consequent submittal could be avoided and will be time and effort saving.

12. Lessons Learned Challenges (what needs improvement or what went well?):

Communication between the 'project' and the consultant has to be not only for "request for information" , but for the advance of work toward the next submittal also.
The PDG's meetings are very useful tools.

13. Lessons Learned Recommendations (how would you improve or avoid or why do you think it went so well?):

Schedule periodical meetings/conference calls for updates.

14. Applicability:

All the projects in design phase.

Submitted by: Reta Barasch

Telephone #: X3360 Email: rbarasch@mbta.com

PARKING LOT

D.PL12.1

Lessons Learned Form

QTR. 20 11

- [x] 1. Jan. - Mar.
- [x] 2. Apr. - June
- [x] 3. Jul. - Sept.
- [x] 4. Oct. - Dec.

1. Project Title: Essential Repairs at the South Shore Garages
2. Contract #: W43PS01
3. Lessons Learned #: 1
4. Date: 1/23/2012
5. Project Delivery Method
   - [x] Design - Bid - Build
   - [ ] Design Build
   - [ ] CM @ Risk
6. Phase:
   - [ ] Conceptual Design of 15%
   - [ ] Preliminary Design 15% - 60%
   - [x] Final Design 60% - 100%
   - [ ] Procurement
   - [ ] Construction

7. Project Classification:

☐	System Improvement	☐	Maintenance Facility Improvement
☐	Parking Lot	☐	New Elevator
☐	Roadway	☐	Replacement Elevator
☐	Commuter Rail	☑	Parking Garage
☐	Bridge	☐	Light Rail Right-of-Way
☐	Station Renovation	☐	New Vertical Construction
☐	New Capital Expansion	☐	Environmental
☐	Noise Wall	☐	Heavy Civil
☐	Building Demo	☐	Signal/Comm./Power

8. Lessons Learned Affected Category:

☑	Scope	☑	Time
☑	Cost	☑	Management

9. Is this a safety related lesson? ☐ Yes ☑ No

10. Title of Lessons Learned: Scope Increases affect the Momentum of Projects

11. Background:

On May 10, 2011 it was expected that the 90% design for the essential repairs at the Braintree and Quincy Adams Garages would be completed on September 12, 2011.

By May 24, 2011 the Project was asked to include restoration of 2 bathrooms at the North Quincy Station.

By June 10, 2011 the Project received the MBTA Site Security requirements for the Garages that increased the number of cameras and introduced the build out of the existing communications room to accommodate the camera tie ins.

By June 14th, 2011 the Project was directed to include the repairs and to make the pedestrian bridge linking the Station and Garage at Braintree ADA compliant.

As a result of the scope increases, the 90% design deliverable is expected in April , 2012.

12. Lessons Learned Challenges (what needs improvement or what went well?):

To recover the schedule slippage due to the scope increases, the Project will eliminate the 60% design deliverable and move to the 90% design.

13. Lessons Learned Recommendations (how would you improve or avoid or why do you think it went so well?):

Scope creeps are often necessary to incorporate the latest requirements and to get critical infrastructure repairs completed in a timely manner.

14. Applicability:

All projects in the design and construction phases.

Submitted by: Marjorie B. Madden

Telephone #: 617 222 3797 Email: mmadden@mbta.com

D.PL12.2

Lessons Learned Form

QTR. 20 11

- [ ] 1. Jan. - Mar.
- [ ] 3. Jul. - Sept.
- [ ] 2. Apr. - June
- [x] 4. Oct. - Dec.

1. Project Title: Alewife Parking Garage Repairs
2. Contract #: Z92PS45, Task Order 6
3. Lessons Learned #: 1
4. Date: 1/10/2012
5. Project Delivery Method
   - [x] Design - Bid - Build
   - [ ] Design Build
   - [ ] CM @ Risk
6. Phase:
   - [ ] Conceptual Design of 15%
   - [x] Preliminary Design 15% - 60%
   - [x] Final Design 60% - 100%
   - [ ] Procurement
   - [ ] Construction

7. Project Classification:

☐	System Improvement	☐	Maintenance Facility Improvement
☐	Parking Lot	☐	New Elevator
☐	Roadway	☐	Replacement Elevator
☐	Commuter Rail	☑	Parking Garage
☐	Bridge	☐	Light Rail Right-of-Way
☐	Station Renovation	☐	New Vertical Construction
☐	New Capital Expansion	☐	Environmental
☐	Noise Wall	☐	Heavy Civil
☐	Building Demo	☐	Signal/Comm./Power

8. Lessons Learned Affected Category:

☐	Scope	☐	Time
☑	Cost	☐	Management

9. Is this a safety related lesson? ☐ Yes ☑ No

10. Title of Lessons Learned: Negotiated Fixed Fee for Design Services

11. Background:

As per the Contract Administration revised Exhibit A the Project Office is required to negotiate the fixed fee for design services. This requirement is cited in the FTA Circular language as noted below:

(1) Profit. FTA expects the recipient to negotiate profit as a separate element of the cost for each contract in which there has been no price competition, and in all acquisitions in which the recipient performs or acquires a cost analysis. To establish a fair and reasonable profit, the recipient needs to consider the complexity of the work to be performed, the risk undertaken by the contractor, the contractor's investment, the amount of subcontracting, the quality of the contractor's record of past performance, and industry profit rates in the surrounding geographical area for similar work.

Therefore, the Project Office , as part of the review of the scope and fee proposal, negotiates a fixed fee with the Consultant that is commensurate with the degree of difficulty, the specialty of the engineering services, the consultant's liability for the deliverables and the profit history for similar work by other consultants.

This negotiated fixed fee is shown on Line 9 of the Exhibit A that is processed for approval.

12. Lessons Learned Challenges (what needs improvement or what went well?):

The Project Office finds that payment requests do not reflect an invoice billing that is consistent with the negotiated fixed fees.

13. Lessons Learned Recommendations (how would you improve or avoid or why do you think it went so well?):

Instead of addressing the issue on a Project by Project basis and invoice by invoice basis can Contract Administration state the negotiated fixed fee in the contracts to the Consultants, track and monitor the negotiated fixed fee for each approved action and require the Consultants to bill consistent with the negotiated fixed fee?

14. Applicability:

All Design contracts.

Submitted by: Marjorie B. Madden

Telephone #: 617 222-3797 Email: mmadden@mbta.com

D.PL12.3

Lessons Learned Form

QTR. 20 11

- [ ] 1. Jan. - Mar.
- [ ] 3. Jul. - Sept.
- [ ] 2. Apr. - June
- [x] 4. Oct. - Dec.

1. Project Title: Salem Station Improvements and Parking Garage
2. Contract #: W92PS04
3. Lessons Learned #: 1
4. Date: January 10, 2012
5. Project Delivery Method
   - [ ] Design - Bid - Build
   - [ ] Design Build
   - [x] CM @ Risk
6. Phase:
   - [x] Conceptual Design of 15%
   - [ ] Preliminary Design 15% - 60%
   - [ ] Final Design 60% - 100%
   - [ ] Procurement
   - [ ] Construction

7. Project Classification:

☐ System Improvement	☐ Maintenance Facility Improvement
☐ Parking Lot	☐ New Elevator
☐ Roadway	☐ Replacement Elevator
☐ Commuter Rail	☑ Parking Garage
☐ Bridge	☐ Light Rail Right-of-Way
☐ Station Renovation	☐ New Vertical Construction
☐ New Capital Expansion	☐ Environmental
☐ Noise Wall	☐ Heavy Civil
☐ Building Demo	☐ Signal/Comm./Power

8. Lessons Learned Affected Category:

☑ Scope	☐ Time
☑ Cost	☐ Management

9. Is this a safety related lesson? ☐ Yes ☑ No

10. Title of Lessons Learned: Soil investigations and site history investigation.

11. Background:

The Salem Garage project had developed to 30% design with no borings taken and no investigation work completed on the site. When borings were taken and historical information reviewed we found that the site had a roundhouse and turntable in 1970. The garage size had to be reduced and many items promised to the City of Salem are in jeopardy due to the fixed budget.

12. Lessons Learned Challenges (what needs improvement or what went well?):

Station concrete floors need to be finished with a coating to provide a non-slip surface. One of the biggest problems is finding a material that is cost efficient and can easily be maintained and repaired.

13. Lessons Learned Recommendations (how would you improve or avoid or why do you think it went so well?):

My recommendation is to perform at least two boring to get soil samples as early as possible to identify the soil conditions. Have the designer get Sanborn maps of the site to look at the history of the site to see if further investigation is required.

14. Applicability:

All design contracts should begin with thorough investigative work of the site.

Submitted by: George M. Doherty Jr.

Telephone #: 3081 Email: gdoherty@mbta.com

SYSTEM IMPROVEMENTS (OPS. PROJECT)

D.SI12.1

Lessons Learned Form

QTR. 20 12

- [x] 1. Jan. - Mar.
- [ ] 2. Apr. - June
- [ ] 3. Jul. - Sept.
- [ ] 4. Oct. - Dec.

1. Project Title: Repair/Rehab. of System-wide Tunnels
2. Contract #: Y92PS03
3. Lessons Learned #: 1
4. Date: 1/11/12
5. Project Delivery Method
   - [x] Design - Bid - Build
   - [ ] Design Build
   - [ ] CM @ Risk
6. Phase:
   - [ ] Conceptual Design of 15%
   - [ ] Preliminary Design 15% - 60%
   - [x] Final Design 60% - 100%
   - [ ] Procurement
   - [ ] Construction

7. Project Classification:

☑	System Improvement	☐	Maintenance Facility Improvement
☐	Parking Lot	☐	New Elevator
☐	Roadway	☐	Replacement Elevator
☐	Commuter Rail	☐	Parking Garage
☐	Bridge	☐	Light Rail Right-of-Way
☐	Station Renovation	☐	New Vertical Construction
☐	New Capital Expansion	☐	Environmental
☐	Noise Wall	☐	Heavy Civil
☐	Building Demo	☐	Signal/Comm./Power

8. Lessons Learned Affected Category:

☑	Scope	☐	Time
☐	Cost	☐	Management

9. Is this a safety related lesson? ☐ Yes ☑ No

10. Title of Lessons Learned: Equipment for Consultant Design Inspection Contracts

11. Background:

This contract consists of design for the Repair/Rehab. of system-wide tunnels. It also included the development of estimated repair quantities which involved the evaluation inspection of the existing tunnels.

12. Lessons Learned Challenges (what needs improvement or what went well?):

Hi-Rail vehicles along with lift trucks is needed for the inspection of our tunnels. The MBTA was responsible in providing the equipment to the consultant to perform their inspections. The equipment was either never available when needed or very difficult to secure for the work.

13. Lessons Learned Recommendations (how would you improve or avoid or why do you think it went so well?):

The MBTA should consider having the consultant provide and include the equipment required to perform the inspections into their design proposals. This would eliminate delay claims to the MBTA for not having equipment available which caused the cancellation of the work.

14. Applicability:

Design contracts which require equipment for inspection of tunnels and stations.

Submitted by: Ken Lim

Telephone #: 617-222-4487 Email: KLim@mbta.com

STATION RENOVATION (RAPID TRANSIT)

D.SR12.1

Lessons Learned Form

QTR. 20 11

- [ ] 1. Jan. - Mar.
- [x] 3. Jul. - Sept.
- [ ] 2. Apr. - June
- [x] 4. Oct. - Dec.

1. Project Title: Charlie Store at Downtown Crossing
2. Contract #: Z92PS25
3. Lessons Learned #: 1
4. Date: 1/4/2012
5. Project Delivery Method
   - [ ] Design - Bid - Build
   - [x] Design Build
   - [ ] CM @ Risk
6. Phase:
   - [ ] Conceptual Design of 15%
   - [ ] Preliminary Design 15% - 60%
   - [x] Final Design 60% - 100%
   - [ ] Procurement
   - [ ] Construction

7. Project Classification:

☐	System Improvement	☐	Maintenance Facility Improvement
☐	Parking Lot	☐	New Elevator
☐	Roadway	☐	Replacement Elevator
☐	Commuter Rail	☐	Parking Garage
☐	Bridge	☐	Light Rail Right-of-Way
☑	Station Renovation	☐	New Vertical Construction
☐	New Capital Expansion	☐	Environmental
☐	Noise Wall	☐	Heavy Civil
☐	Building Demo	☐	Signal/Comm./Power

8. Lessons Learned Affected Category:

☑	Scope	☑	Time
☑	Cost	☐	Management

9. Is this a safety related lesson? ☐ Yes ☑ No

10. Title of Lessons Learned: Fast track/design build

11. Background:

The GM requested the relocation of all Pass Sales, Senior TAP, and Ride facilties to one central, accessible, state of the art, all-in-one shopping location at the concourse of Downtown Crossing.

The budget, scope and scheduled were discussed at a very conceptual level and commitments were made based upon very basic information.

12. Lessons Learned Challenges (what needs improvement or what went well?):

The budget, scope and schedule were not realistic given the level of effort required. The exact location of the office within the concourse was not decided, and factors/risks such as permitting and contracting requirements, hazmat, technical, mechanical, code, and other issues were unknown. Further, the point to transition plans from the designer to the Contractor was undefined. There was a limited level of funding for design and construction, and it was not adequate, yet to maintain schedule the project was progressed while the budget issues were resolved. The modification from a change order to a stand alone contract further delayed the schedule due to the higher level of documentation.

13. Lessons Learned Recommendations (how would you improve or avoid or why do you think it went so well?):

An advanced risk analysis would have helped, and then communication of those risks to senior management may have helped create more realistic expectations with regards to scope, schedule and budget. Closer coordination and debate with Contract Administration early into the job may have rendered a clearer direction, sooner. We also need to understand that this is a hybrid project with its own unique set of obstacles and risks and these jobs usually require problem solving on-the-go. Our job is to successfully complete projects. This will be no different.

14. Applicability:

Submitted by: Curtis Nikitas

Telephone #: 617-222-4792 Email: cnikitas@mbta.com

D.SR12.1

Lessons Learned Form

QTR. 20 11

- [x] 1. Jan. - Mar.
- [x] 2. Apr. - June
- [x] 3. Jul. - Sept.
- [x] 4. Oct. - Dec.

1. Project Title: Accessibility Improvements at Wollaston, Hynes and Symphony Stations
2. Contract #: A46PS01
3. Lessons Learned #: 1
4. Date: 1/23/2012
5. Project Delivery Method
   - [x] Design - Bid - Build
   - [ ] Design Build
   - [ ] CM @ Risk
6. Phase:
   - [x] Conceptual Design of 15%
   - [ ] Preliminary Design 15% - 60%
   - [ ] Final Design 60% - 100%
   - [ ] Procurement
   - [ ] Construction

7. Project Classification:

☐ System Improvement	☐ Maintenance Facility Improvement
☐ Parking Lot	☐ New Elevator
☐ Roadway	☐ Replacement Elevator
☐ Commuter Rail	☐ Parking Garage
☐ Bridge	☐ Light Rail Right-of-Way
☑ Station Renovation	☐ New Vertical Construction
☐ New Capital Expansion	☐ Environmental
☐ Noise Wall	☐ Heavy Civil
☐ Building Demo	☐ Signal/Comm./Power

8. Lessons Learned Affected Category:

☑ Scope	☑ Time
☑ Cost	☑ Management

9. Is this a safety related lesson? ☐ Yes ☑ No

10. Title of Lessons Learned: Design Service Solicitations in RFP's for accessibility improvements

11. Background:

On May 14, 2010 the MBTA issued a design NTP to provide services for accessibility improvements at the Wollaston, Hynes and Symphony Stations.

On October 25, 2010 the Project was notified by the MBTA Office of System wide Accessibility (SWA) that the accessibility improvements at the Wollaston, Hynes and Symphony Stations must provide redundant elevators. This requirement significantly changed the design criteria and required the Consultant to revisit the design program for elevator redundancy and the ensuing increased power needs at each Station. Also, because the construction value increased, additional Code compliance thresholds were triggered.

12. Lessons Learned Challenges (what needs improvement or what went well?):

The solicitation for the design services did not specify the MBTA requirement for redundancy.

13. Lessons Learned Recommendations (how would you improve or avoid or why do you think it went so well?):

Solicitations for design service to improve accessibility should be reviewed and approved by the MBTA SWA Office before the RFP goes public.

14. Applicability:

All solicitations for accessibility improvements.

Submitted by: Marjorie B. Madden

Telephone #: 617 222 3797 Email: mmadden@mbta.com