MassDOT
Massachusetts Department of Transportation
Highway Division

Project Execution Training

Design-Build

February 17 , 2023, 10:00AM – 12:00PM

Introductions

Mike O'Dowd – Director of Major Projects

Narayana "Murthy" Kolla – Manager of Alternative Procurement and Delivery

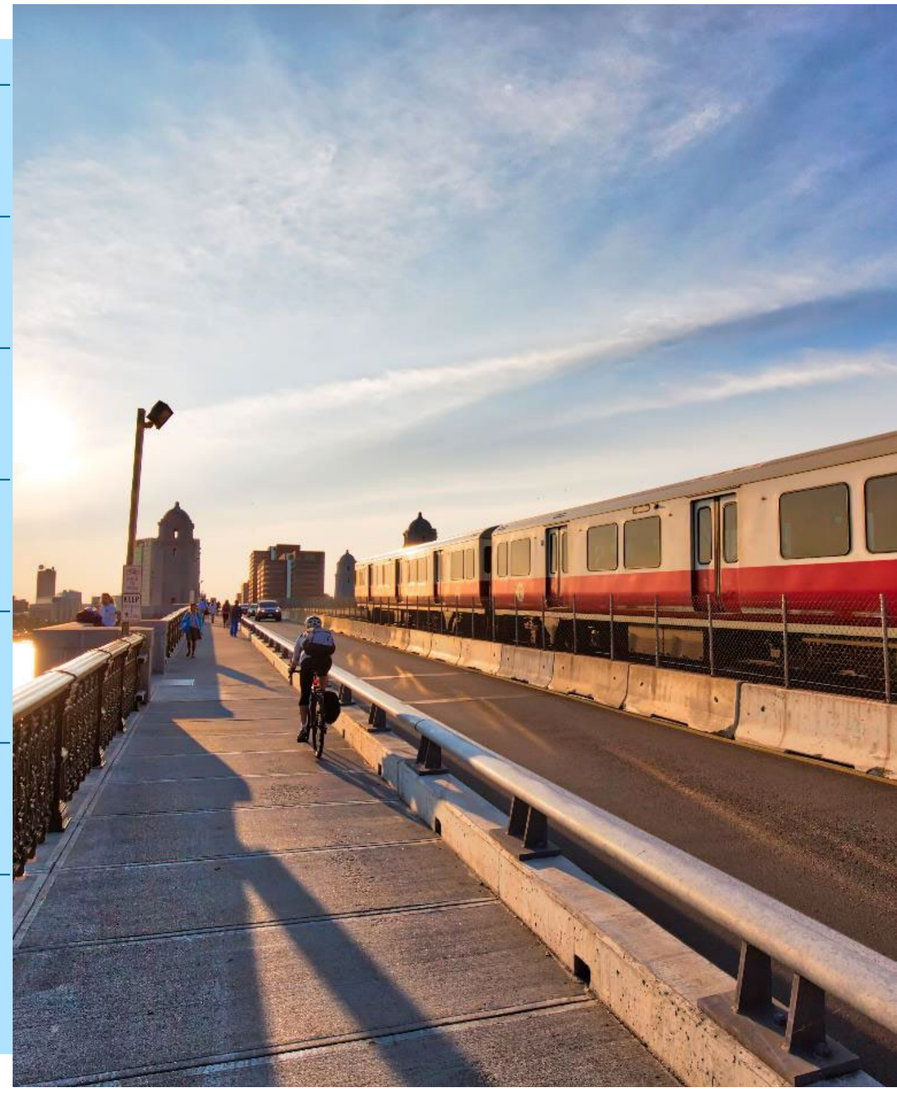
Susan Harrington – Design-Build Project Manager

Mike Drew – Design-Build Project Manager

Frank Welch – Design-Build Project Manager

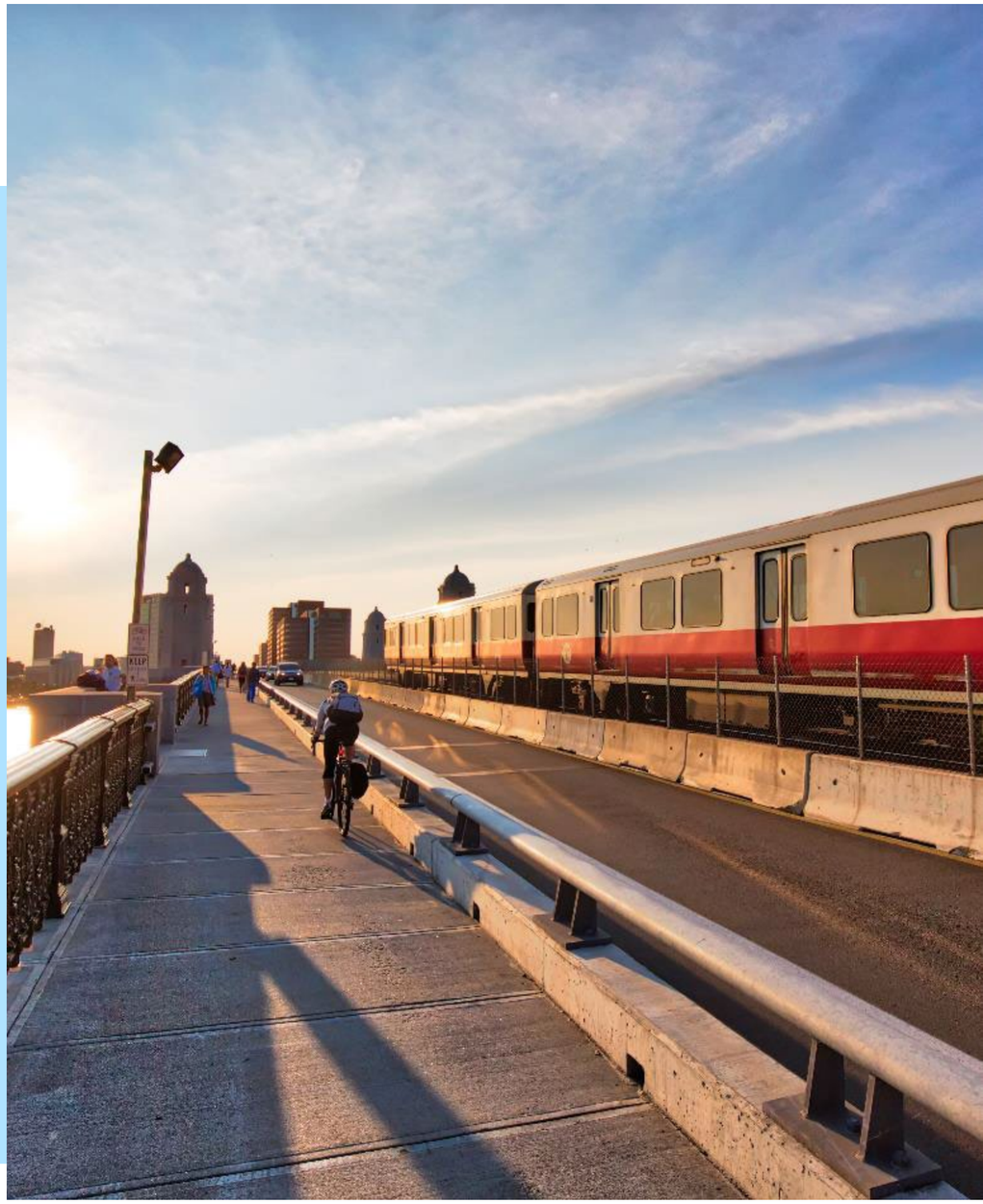
Kathy Barr – Assistant District Construction Engineer

Jean-Pierre Telemaque –Area Engineer/Resident Engineer



Agenda

1. Design-Build Project Development
2. Design-Build Procurement Process
3. Roles and Responsibilities
4. Post-Award Project Initiation
5. Contract Documents and Deliverables
6. Project Submittals and Reviews
7. Construction Procedures and Shop Drawings
8. Quality Assurance
9. Lessons Learned

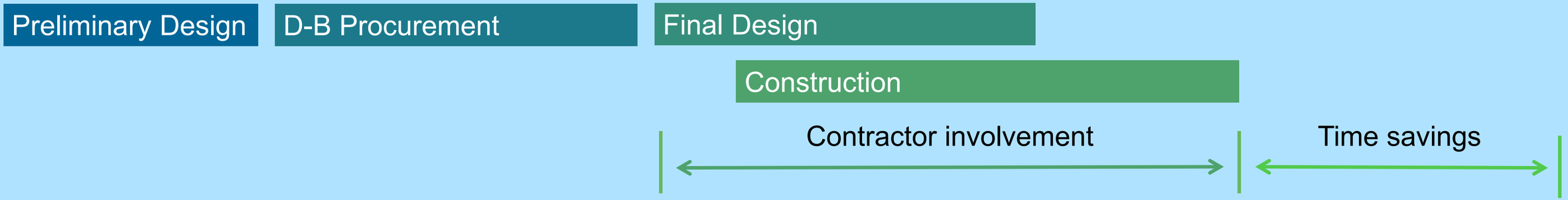


Design-Build Project Development

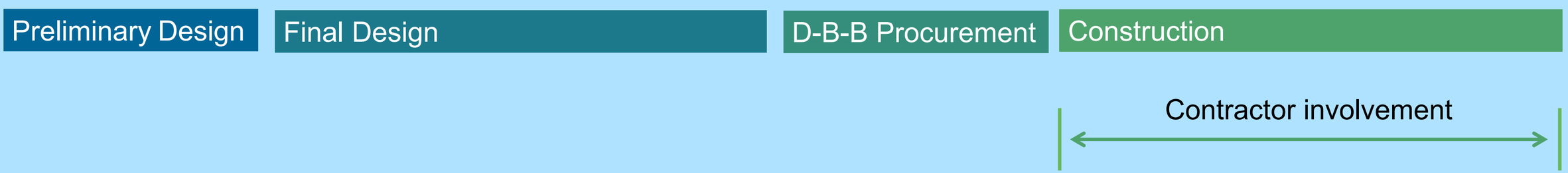
PROJECT SELECTION

Project Delivery Sequence

Design-Build (DB)



Design Bid Build (D-B-B)



PROJECT SELECTION

What makes a project a good candidate?

- Scope provides opportunity for innovative design solutions such as minimizing traffic and environmental impacts
- Specialized scope warrants short-listing best qualified teams
- Project may benefit from earlier Contractor involvement
- Requires an expedited Project Delivery i.e. earlier construction start and completion

PROJECT DEVELOPMENT

Base Technical Concept (BTC)

- Project team meets to determine level of design development required
- The procurement documents are the Base Technical Concept (BTC)
  - Preliminary Design Plans
  - Request for Proposal Volumes I-III with draft special provisions, reports and reference documents
- The BTC may convey as much or as little design information as necessary to have a successful procurement/project
- Developed to represent MassDOT preferences and establish the minimum baseline requirements to be equaled or exceeded by a Design-Build Team.

PROJECT DEVELOPMENT

Request for Proposals

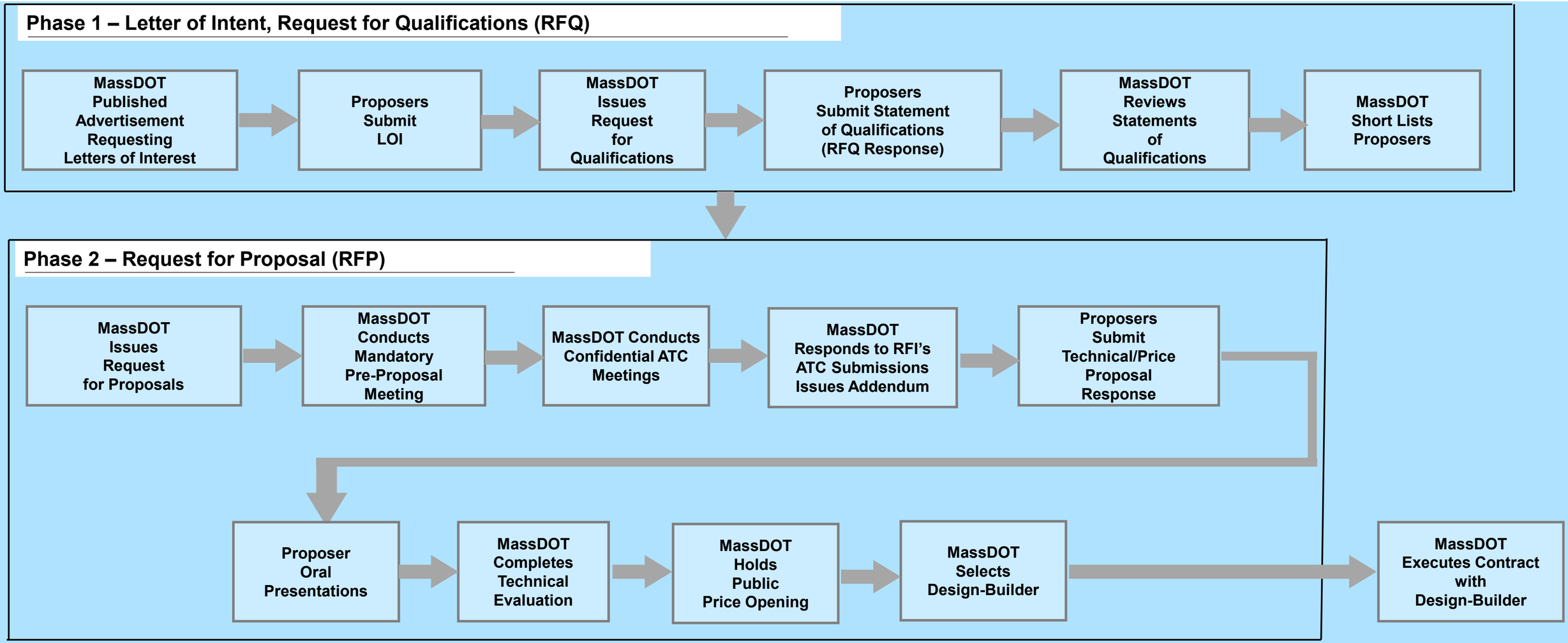
The Technical Provisions Include:

- Detailed scope of work
- Technical and design criteria (prescriptive and performance)
  - Prescriptive requirements (examples “Must Have”)
    - Number of travel lanes
    - Pavement design
    - Historic or architectural features
  - Performance requirements (examples)
    - Lighting system that meets code
    - Electronic toll system accuracy (99.9%)
    - 75-year design life
- Schedule requirements
- Traffic requirements

Procurement Process

PROCUREMENT PROCESS

Procurement Diagram



PROCUREMENT PROCESS

Selection Committee Process

- MassDOT Selection Committee is responsible for the evaluation and scoring of the Statement of Qualifications (SOQ) and Technical Proposals
- The Selection Committee is approved by the Chief's Office:
- Combination of District and HQ Staff
- Each participant involved in the selection process signs a Confidentiality Agreement
- Conversations are confidential, files are stored on a confidential SharePoint site with limited distribution

PROCUREMENT PROCESS

Alternative Technical Concepts (ATCs)

- Alternative Technical Concepts (ATCs) are requests by a Proposer to modify a contract requirement.
- Process utilized to allow the incorporation of innovation and flexibility into Technical Proposals.
- Approval is at MassDOT's sole discretion
- ATCs must provide an end product equal to or better than the BTC
- Typical timeline between Final ATC approval to Proposal Submission:
  - Small Projects – 4 Weeks
  - Complex Projects – 6 Weeks

PROCUREMENT PROCESS

ATC Process

- Executive Summaries
- Confidential Meetings
  - Up to 3 FINAL ATCs may be submitted
  - Selection Committee or designated PDC lead to ask questions
  - Follow-up questions if needed
  - No Commercial issues discussed evaluated on technical merit
  - Attendance –MassDOT, FHWA and PDC
- MassDOT provides written response within 3 business days after meeting
  - Approved
  - Approved with conditions
  - Not Approved (with explanation provided)

PROCUREMENT PROCESS

Example of Best-Value Selection

Best Value = Lowest Overall Value Rating

HOPKINTON-WESTBOROUGH 607977-116673

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Federal-Aid No. NFP(IN)/HIP(BR)/NHP(IM)/HIP(IN)/GRT-495S(301)
Interchange Improvements, Interstate 495 (NB & SB)
at Interstate 90 (EB & WB)

PROJECT VALUE: $340,000,000.00

HOPKINTON-WESTBOROUGH	BHD-O&G-AETNA I-495 I-90 JV	SKANSKA MCCOURT IV JV	THE MIDDLESEX CORP	*STEP*	
TECHNICAL SCORE	88.42	86.45	78.84	*1*	*Pre-Entered by MassDOT*
PRICE PROPOSAL	$394,422,000.00	$488,200,495.00	$488,949,856.00	*2*	*Transferred from Bid Express*
OVERALL VALUE RATING = PRICE PROPOSAL / TECHNICAL SCORE	4,460,778.105	5,647,200.636	6,201,799.290	*3*	*Calculated by MassDOT (step 2 / step 1)*
	↑				***Apparent Best Value***

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PROCUREMENT PROCESS

Example of Best-Value Selection

Best Value is lowest price per quality score point

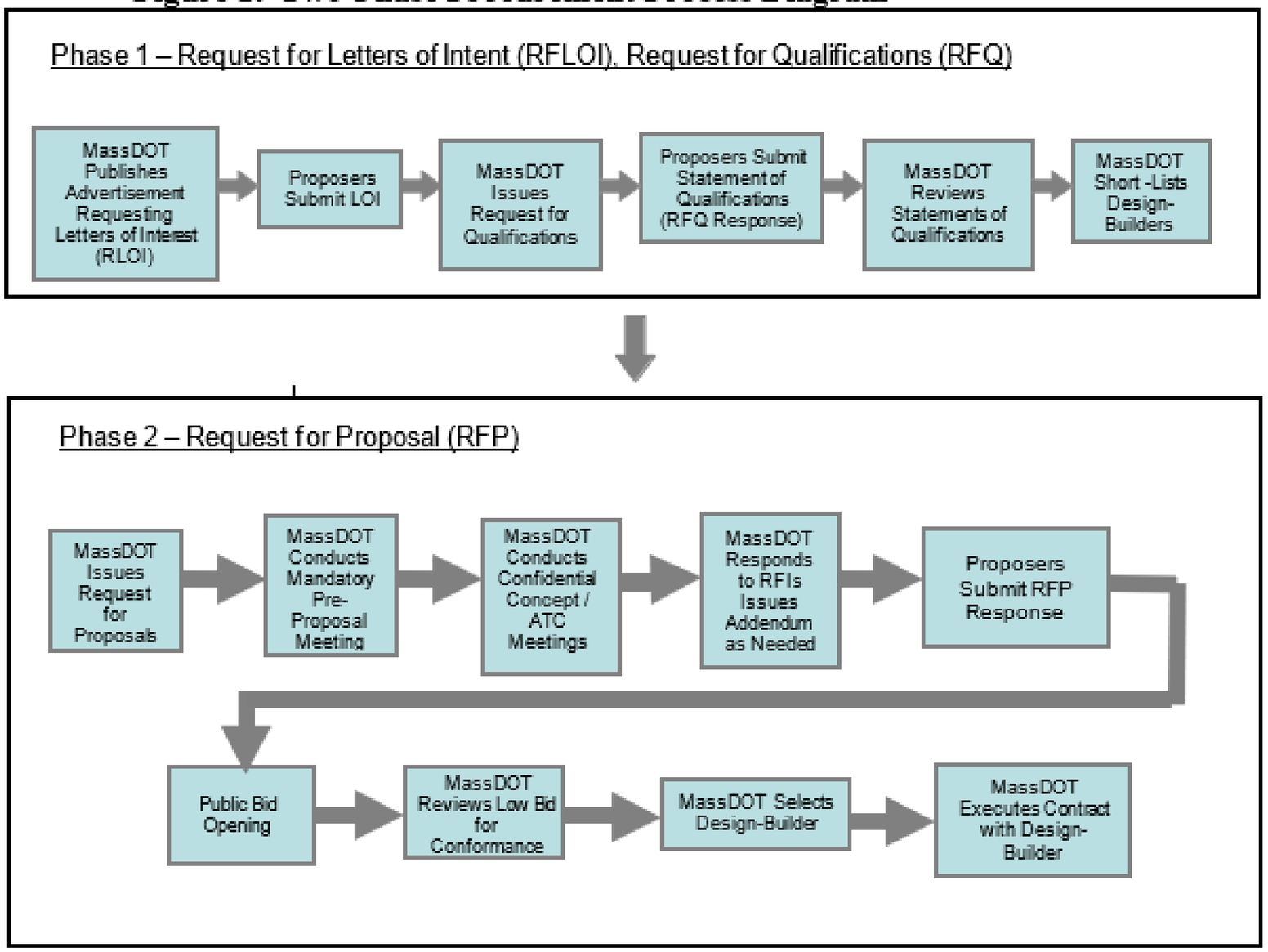
Bridge Replacement (A-07-016=N-11-017) Whittier Bridge
Interstate 95 Improvement Project over the Merrimack River (ABP) (DESIGN/BUILD)

Whittier Bridge (A-07-016=N-11-017)	Barletta Heavy/O&G Joint Venture	Walsh-McCourt JV1	White - Kiewit Whittier (J.V.)	STEP
TECHNICAL SCORE	786.75	904.18	778.12	1 Pre-Entered by MassDOT
SEALED PRICE PROPOSAL	$262,100,100.00	$292,155,280.00	$345,985,970.00	2 Transferred from Bid-Express
OVERALL VALUE RATING = SEALED PRICE PROPOSAL / TECHNICAL SCORE	333,142.80	323,116.28	444,643.46	3 Calculated by MassDOT (step 2 / step 1)
		↑		Apparent Winning DB Entity

PROCUREMENT PROCESS

Low Bid Design-Build (Pilot)

Figure 1: Two-Phase Procurement Process Diagram



PROCUREMENT PROCESS

Stipends and Debriefings

Guidelines for Estimating Stipend Amounts

- Unsuccessful Proposers are provided a stiped to compensate for some of the cost of preparing their Proposal
- Grants MassDOT the ability to utilize any concepts proposed in unsuccessful Proposer's Technical Proposal
- Stipend amounts may vary by contract value and complexity
  - By policy MassDOT currently typically utilizes .002 or .2% of the office estimate

Debriefings

Phase 1 - *To request a debriefing, teams should email Murthy*

- Opportunity for proposers to view their SOQ score sheets

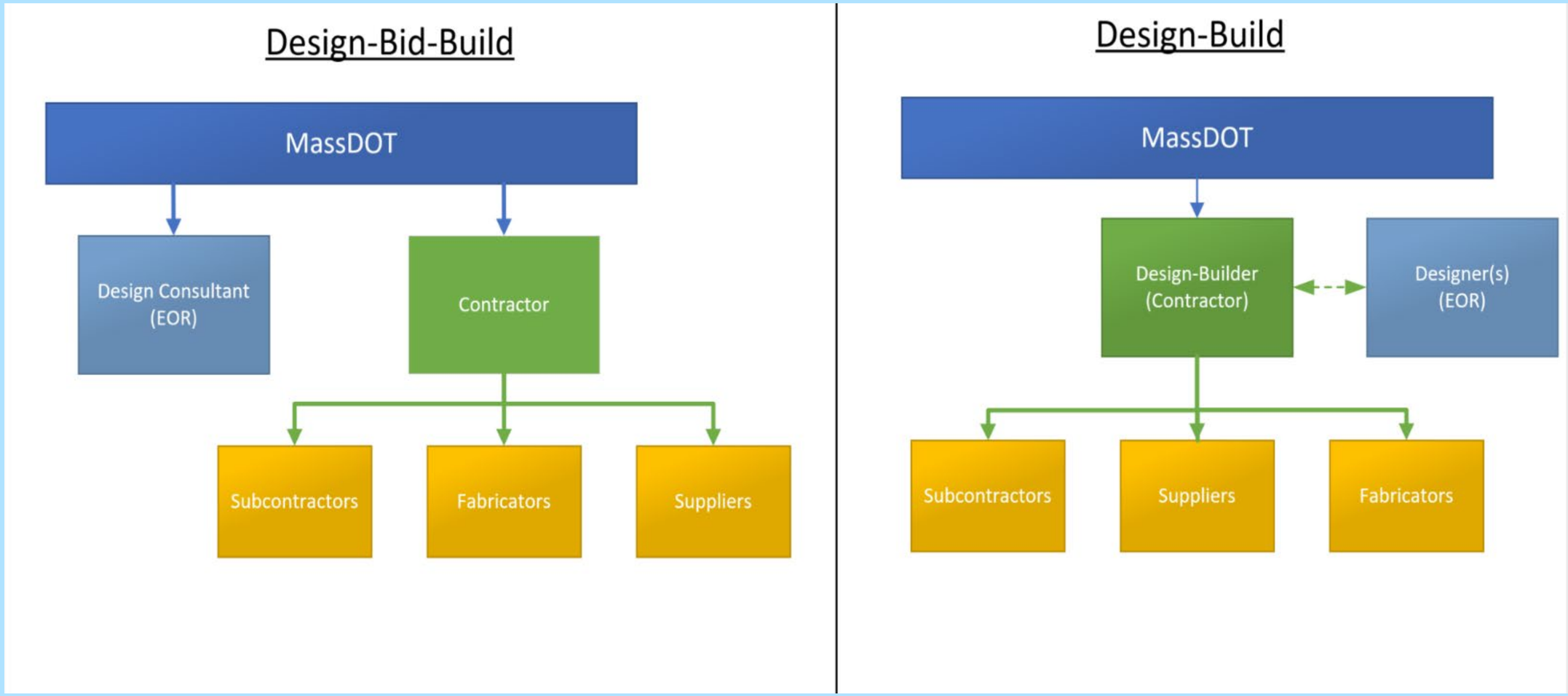
Phase 2 – After award

- Opportunity for shortlisted teams to view all team's technical scores
- Learn about main strengths and weaknesses of your proposal
- Opportunity to view other team's Technical Proposals

Roles and Responsibilities

DESIGN-BUILD PROJECT EXECUTION

DBB vs DB Structure



DESIGN-BUILD PROJECT EXECUTION

MassDOT Overview

The selected Design-Builder completes the design and constructs the project

Successful project execution relies on:

- Communication
- Expertise
- Teamwork

Projects are often accelerated as construction can commence prior to the completion of final design

Concurrent design and construction results in the Design-Build Project Manager and Resident Engineer having overlapping responsibilities:

- Requests for Information
- Submittal Reviews
- Extra Work Order Reviews

DB PM and RE work together to contribute their expertise in resolving both design and construction issues

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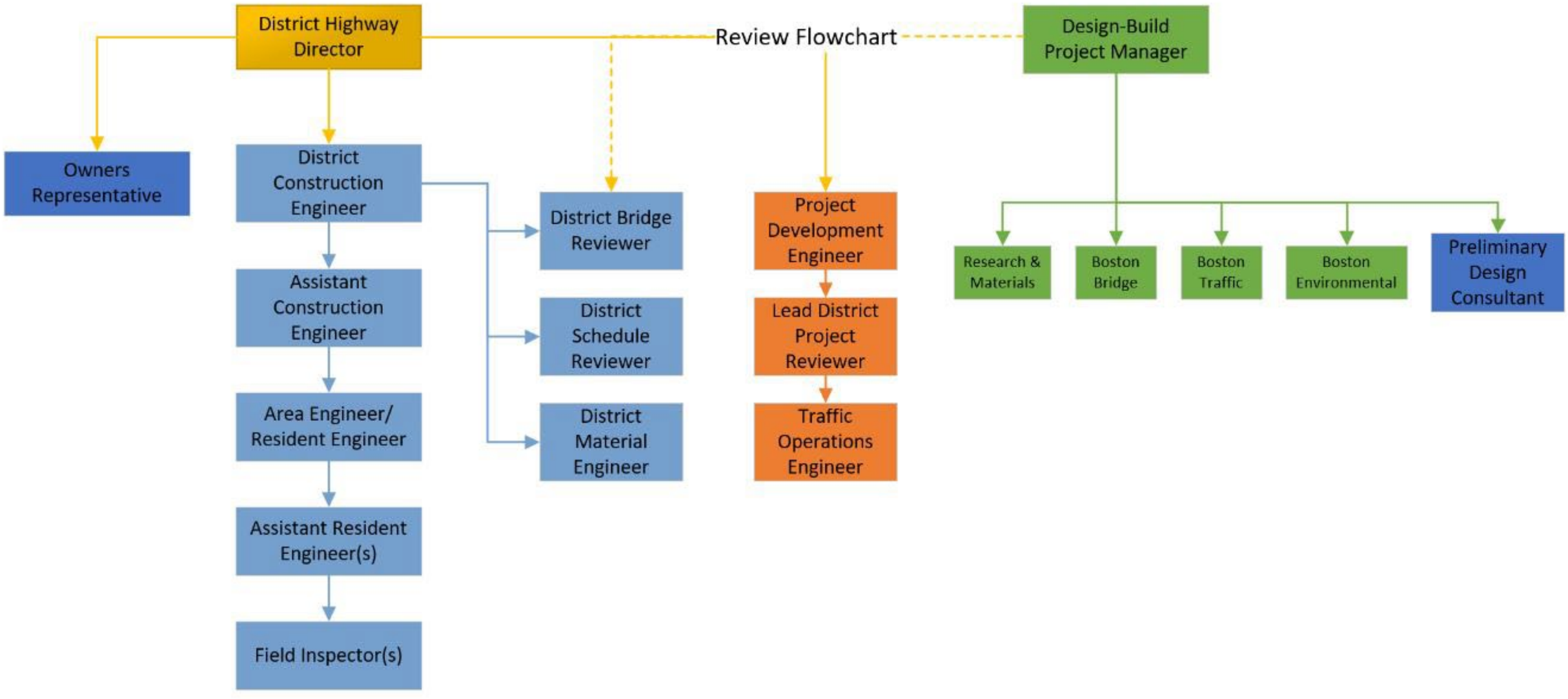
Typical Design-Build Organizational Chart



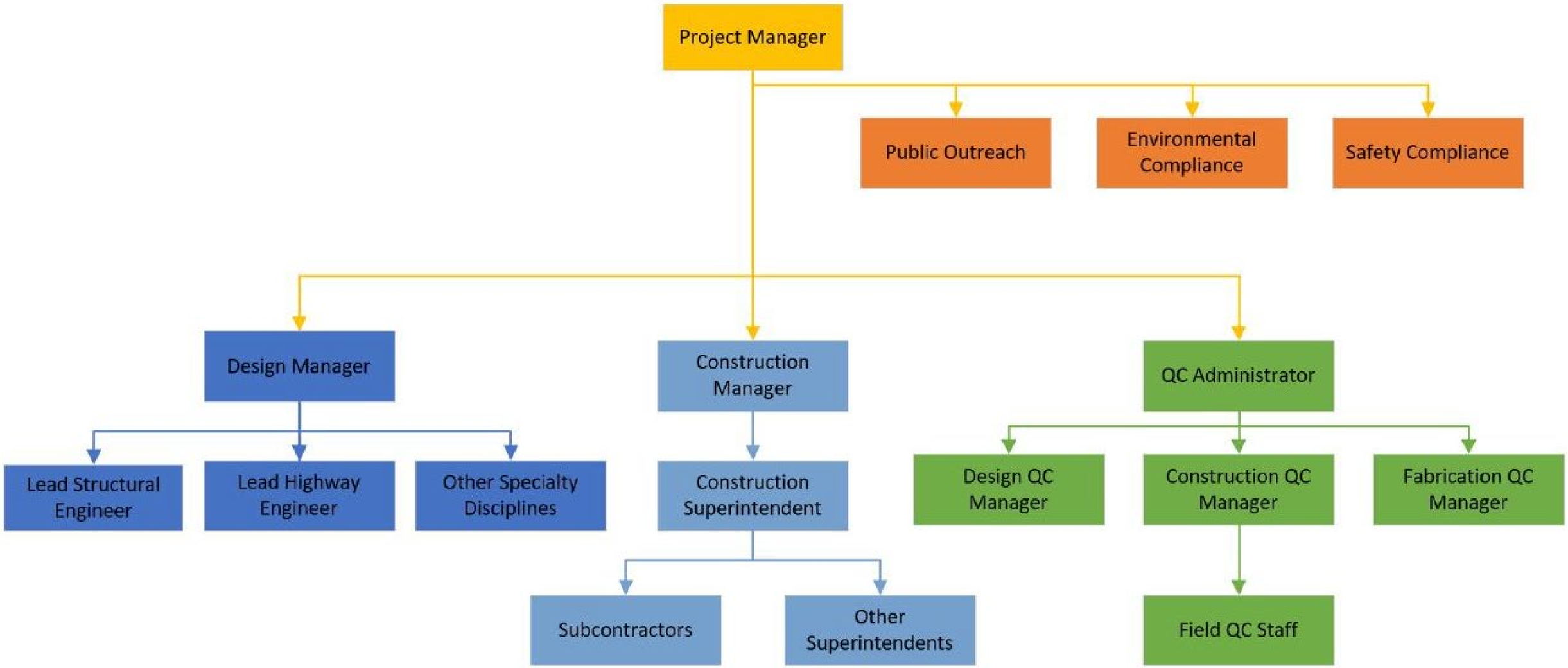
ROLES AND RESPONSIBILITIES

Design-Builder's Project Manager

- Project Manager (PM) is designated as single-point of contact for the Project
- PM is responsible to coordinate both design and construction activities
- Design Manager, Construction Managers and Design-Builder's Quality Control Administrator reports to PM.
- Also coordinates Public Outreach, Environmental Compliance and Safety Compliance

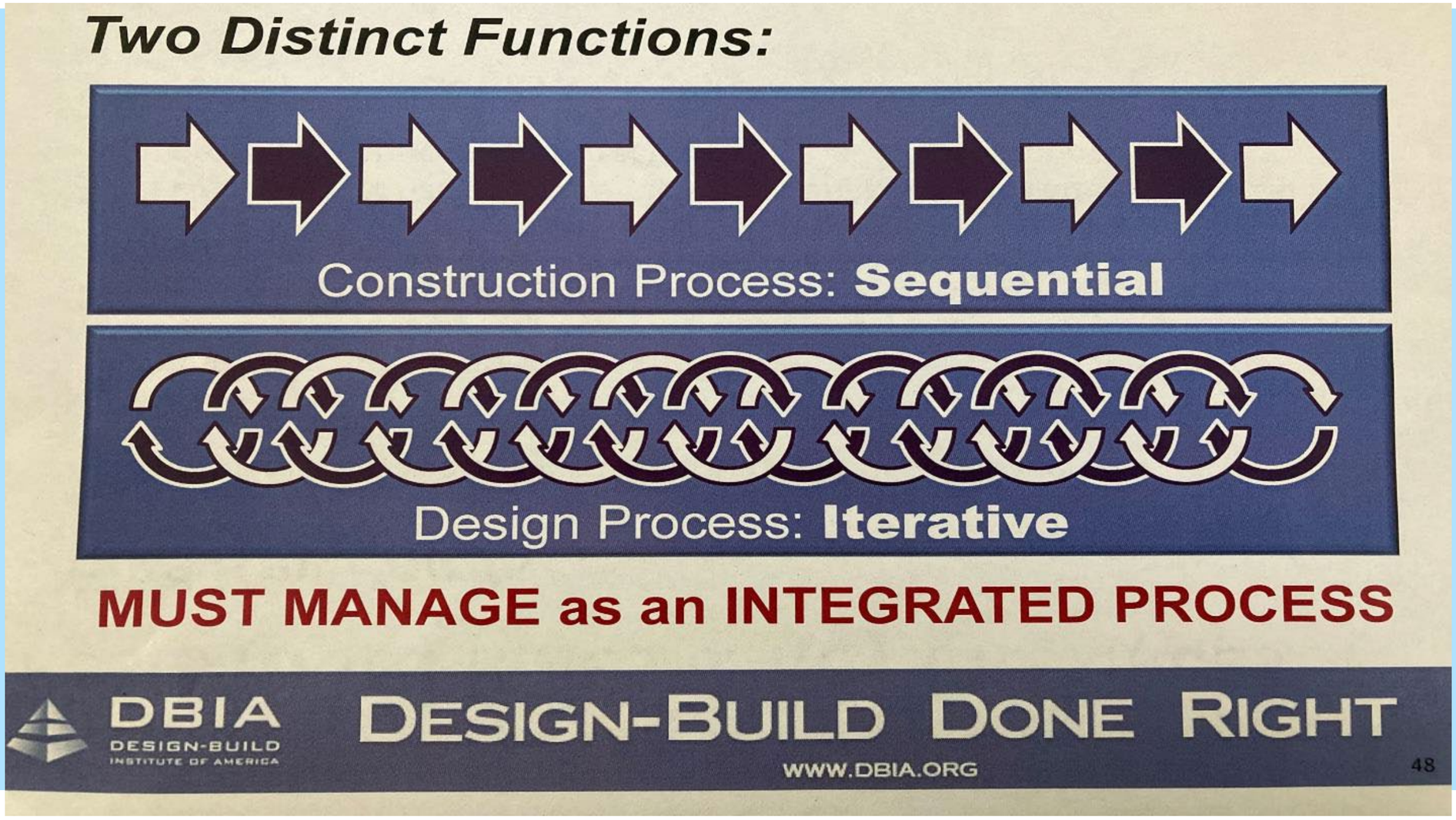
ROLES AND RESPONSIBILITIES

Design-Builder's Typical Organizational Chart



ROLES AND RESPONSIBILITIES

Post Award Roles & Key Interfaces



Post-Award Project Initiation

POST-AWARD PROJECT INITIATION

Early Action Items

Internal Start-Up Meeting

Design-Build Kick-Off Meeting

R&M Early Engagement

Pre-Construction Meeting

Regular Progress Meetings

POST-AWARD PROJECT INITIATION

Internal Start-Up Meeting

- Meeting at District and/or virtual option
- Discuss Reviewers Roles and Responsibilities
- Identify and Review High Risk Items
- Discuss Design-Build Mindset
- Review QA Expectations

Meeting Members

- Design-Build PM
- MassDOT District Staff
  - Traffic
  - Projects
  - Construction
- MassDOT Boston Staff
  - Construction
  - Reviewers
  - Metals Control
- MassDOT Research and Materials
- Federal Highway Administration
- Preliminary Design Consultant
- Owner's Rep (when applicable)

POST-AWARD PROJECT INITIATION

Design-Build Kick-Off Meeting

- DB PM initiates Project Kick-off Meeting after award
- Informal Meet and Greet or Partnering Sessions
- Design-Builder provides overview of their Technical Proposal
- Should include a review of any ATCs incorporated into Proposal
- Discuss potential Risks and Mitigation Strategies
- Construction & Design Look-Ahead

Meeting Members

- Design-Build PM
- Design-Builder Key Members
- Preliminary Design Consultant
- MassDOT Technical Reviewers
- MassDOT Construction
- Federal Highway
- Owner's Rep (when applicable)

POST-AWARD PROJECT INITIATION

R&M Early Engagement

Resident Engineer should coordinate to schedule a kick-off meeting with all Material and Metals personnel that will be involved with the project

- Introduce POCs from Metals, R&M and District Materials
- Discuss LIMMS roles and responsibilities
- Identify key ERC packages and expected schedules
- Discuss roles and responsibilities in populating and maintaining RMS360
- Ensure all parties understand their responsibilities relative to quality assurance

POST-AWARD PROJECT INITIATION

Pre-Construction Meeting

Scheduled and facilitated by the District, soon after NTP. Should follow the format of typical Pre-Construction Meetings, with the following additions:

- DB PM is introduced at Point of Contact for project design, submission reviews, and to the stakeholders
- DB PM should speak on communication protocols, Quality Management Plan, review process goals
- Resident Engineer introduced as Point of Contact for Construction Issues
- District Materials Engineer, R&M and ODCR invited to speak
- Design-Builder should present a brief overview of their Technical Proposal
- Key Stakeholders such as City/Town representatives, Utility Companies, Emergency Services are invites

POST-AWARD PROJECT INITIATION

Additional Project Meetings

Quality and Value

- Invest time and effort into planning and executing project meetings

Limit attendees to key stakeholders and decision makers

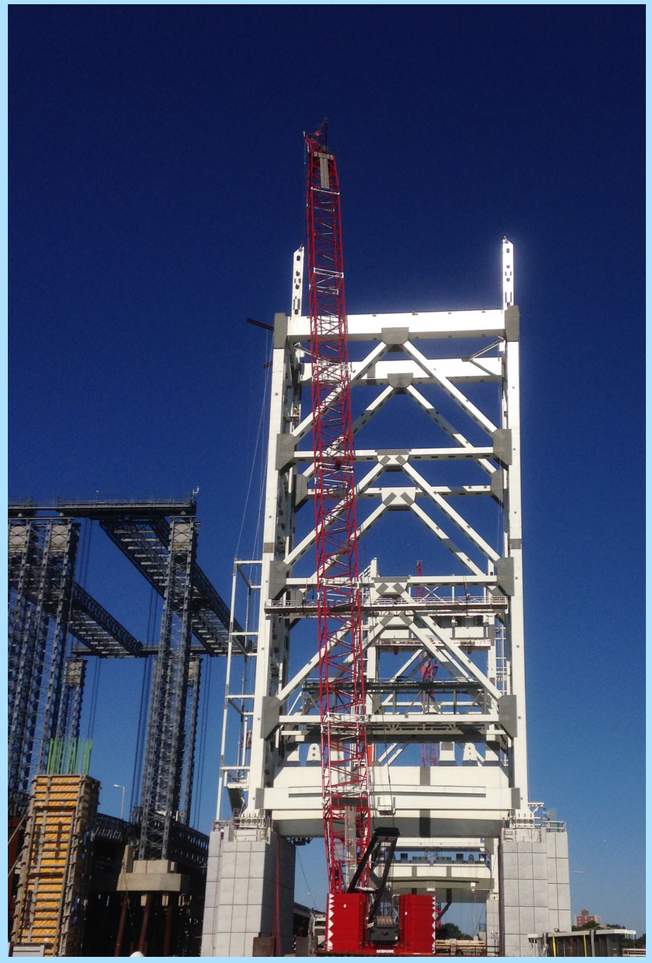
Agenda should be developed for all meetings and shared ahead of time

Design-Builder is responsible for taking and distributing meeting minutes

- Accurate and timely distribution is critical

Standing Bi-Weekly meetings should be utilized for status updates

- Design-Builder should present design and construction look ahead schedules
- Should discuss status of Submittals, RFI, NCR, Materials, etc.
- Technical Breakout sessions should be utilized in lieu of larger meetings whenever appropriate to reduce the time investment of all staff



Contract Documents and Deliverables

CONTRACT DOCUMENTS AND DELIVERABLES

Overview

Project Management

- Project Management Plan
- Quality Management Plan
- Environmental Permitting Matrix
- Public Participation Plan
- Project Schedule
- Submittal Review and Distribution Matrix

Formal Submissions from Design-Builder

- Design Submittals
- Construction Submittals
- Early Release for Construction and Fabrication Submittals

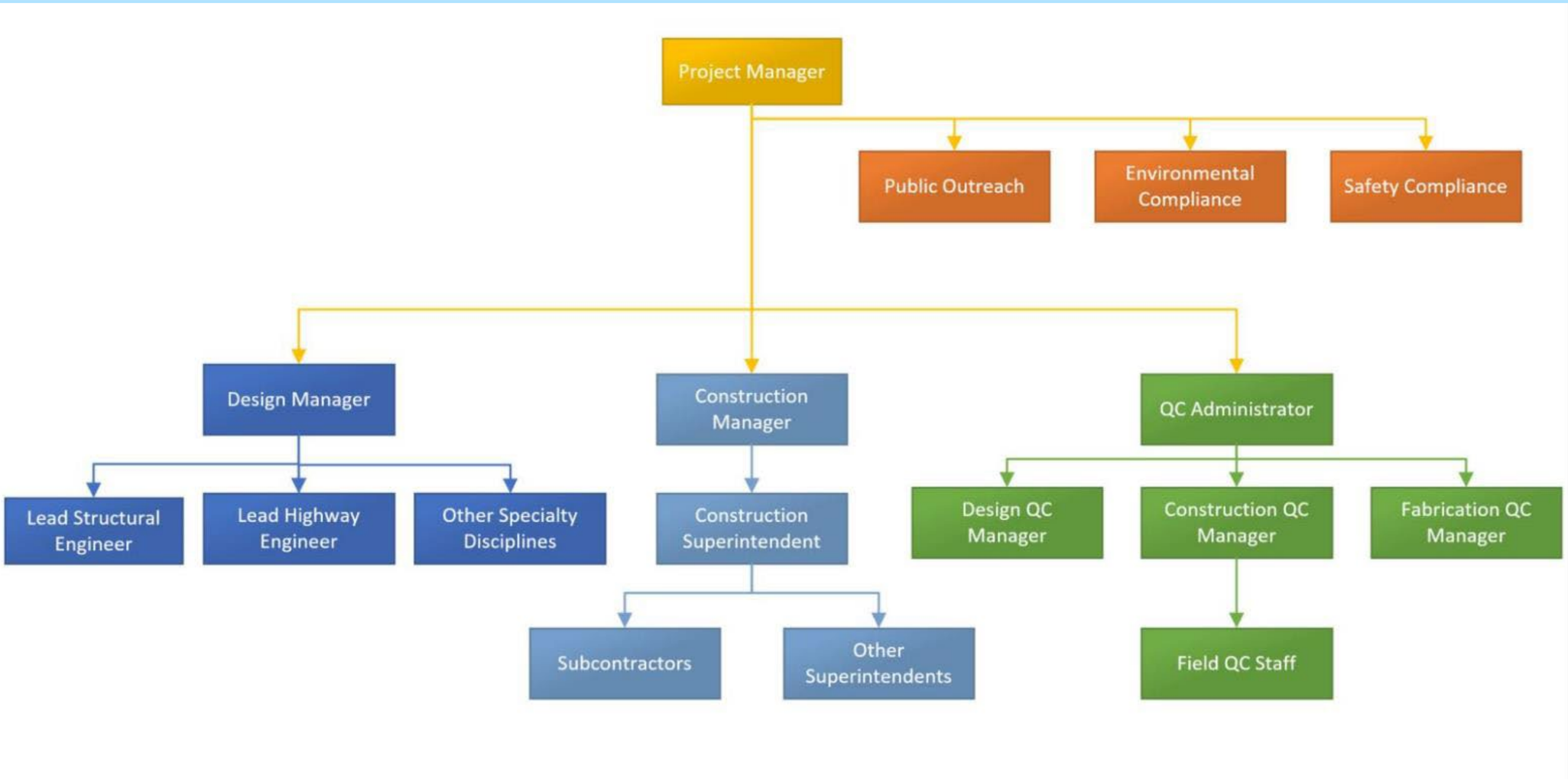
CONTRACT DOCUMENTS AND DELIVERABLES

Project Management Plan

- Objective
- Scope of Work
- Organization (Key Personnel from Design-Builder/MassDOT)
- Administrative Management
- Design Management
- Construction Management
- Procedures to Manage and Control the Work
- Cross Reference against Key Personnel in RFP & SOQ
- Dedicated Personnel added to RFP (ex. Safety, QC Fab Manager, etc)

CONTRACT DOCUMENTS AND DELIVERABLES

Project Management Plan



CONTRACT DOCUMENTS AND DELIVERABLES

Quality Management Plan

Introduction

Quality Control Organization

- Project Team
- Management Personnel
- Quality Control Team

Document Management Procedures

- Electronic Record Sys/Std. naming Convention
- Transmittals/Submittals
- NCR Reporting/Resolution/Closeout

Design Quality Control Procedures

- Design Production Team
- Design QC Team

Construction Quality Control Procedures

- Construction Production Team
- Construction QC Team

CONTRACT DOCUMENTS AND DELIVERABLES

Environmental Permitting Matrix

Massachusetts Department of Transportation
I-495 Bridge Replacement, Haverhill MA
Summary of Permit Conditions
US Army Corp of Engineers MA General Permit; MA Department of Environmental Protection 401 Water Quality Certification, National Marine Fisheries Section 7 Consultation

Action Item	Action Due Date	Permit Citation	Responsible Party	Submittal Required	Status of Action (to be updated throughout construction)	Action Completed (Date and
The contractor will be required to provide the dredge material disposal location to the MassDEP prior to disposal. The estimated volume to be stored, prior to transport to the disposal location, shall be reported to MassDEP.	Prior to dredging	DEP WQC Transmittal No: X268500(Fill) & X268505(Dredge), Special Condition 25	DBE	*Yes*		
No later than 21-days prior to commencement of dredging activity, a Dredged Material dewatering plan shall be submitted to MassDEP and review and approval. At a minimum, the dewatering plan shall include but not be limited to the type of containment, method of dewatering (i.e. mechanical or by gravity), method of collecting the dewatered effluent and method of disposal. Measures shall be taken to assure the adjacent wetland resource areas are adequately protected during dewatering.	21 days prior to dredging	DEP WQC Transmittal No: X268500(Fill) & X268505(Dredge), Special Condition 26	DBE	*Yes*		
No activity authorized by the 401 WQC may begin prior to expiration of the 21-day appeal period or until a final decision is issued by MassDEP if an appeal is filed	Prior to construction	DEP WQC Transmittal No: X268500(Fill) & X268505(Dredge), Special Condition 34	DBE			
A stockpile of erosion control materials shall be kept on-site at all times for emergency and routine replacement. The materials may include but are not limited to silt fence, hay bales, stone riprap, filter dikes, compost filter tubes or any other devices planned for use during construction.	Throughout construction	DEP WQC Transmittal No: X268500(Fill) & X268505(Dredge), Special Condition 15	DBE			
It is the responsibility of the contractor to assure that all wetland resource areas are adequately protected with erosion and sedimentation controls. Additional erosion and sedimentation control barriers beyond that which is shown on the plan may be required.	Throughout construction	DEP WQC Transmittal No: X268500(Fill) & X268505(Dredge), Special Condition 16	DBE			
Best Management Practices (BMPs) shall be implemented during transportation of the dredged material to the licensed receiving facility. At a minimum, when transported upon public roadways, all dredged material shall have no free liquid as determined by the Paint Filter Test or other suitably analogous methodology acceptable to MassDEP, and a tarpaulin or other means shall be used to cover the dredged material during transport.	Throughout construction	DEP WQC Transmittal No: X268500(Fill) & X268505(Dredge), Special Condition 28	DBE			
No Special Condition set forth herein shall be constructed or operate to prohibit MassDEP from taking enforcement against the DOT or its contractors for any failure to comply with the terms and requirements of this 401 Water Quality Certification.	Throughout construction	DEP WQC Transmittal No: X268500(Fill) & X268505(Dredge), Special Condition 33	DBE			
Any authorized structure or fill shall be properly maintained, including maintenance to ensure public safety and compliance with applicable general conditions and activity-specific conditions to a written verification.	During and after construction.	USACE GP, General Condition 32	MassDOT			
Within 180 days of project completion, the applicant shall forward a set of project plans and relevant technical documentation to the Risk Analysis Branch, Mitigation Division, Federal Emergency Management Agency (FEMA), Region 1, 99 High Street, Boston Massachusetts, 02110. This submission shall be made in a digital format, and provide a level of content detail, acceptable to FEMA Region 1 personnel.	Within 180 of project completion	USACE File # NAE-2013-01690, Special Condition 4	DBE/MassDOT	*Yes*		
Future maintenance dredging is not authorized under the 401 WQC	After construction	DEP WQC Transmittal No: X268500(Fill) & X268505(Dredge), Special Condition 30	MassDOT			
Upon completion of construction and once areas have been stabilized all erosion control barriers shall be removed	After construction	DEP WQC Transmittal No: X268500(Fill) & X268505(Dredge), Special Condition 32	DBE			
DISCLAIMER: This document is not to be considered complete description of all permit requirements. Please refer to the permits /applications included with this document.						
Key:		**Responsible Parties**			National Marine Fisheries Service =	NMFS
(orange) = Prior to construction		Massachusetts Department of Transportation	MassDOT		Department of Environmental Protection =	MassDEP
(yellow) = During project construction		Design/ Build Entity =	DBE		U.S. Army Corps of Engineers =	USACE
(green) = After completion of construction		Not Applicable =	N/A			

POST-AWARD PROJECT INITIATION

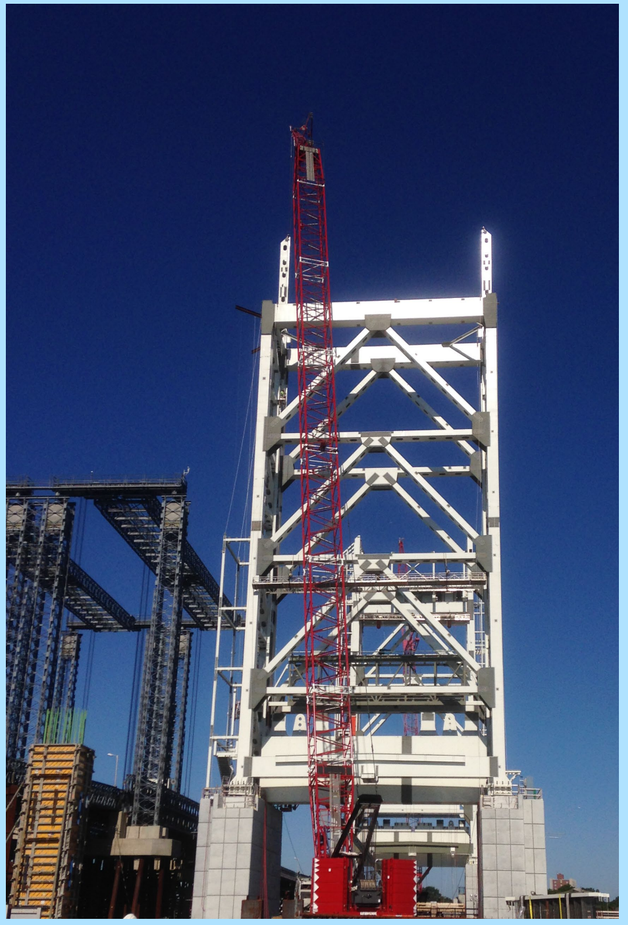
Public Participation Plan

Comprehensive Plan of public participation on this specific project

- Describes the division of labor between MassDOT and the Design-Builder
- Lists the activities, meetings, written and graphic materials that will be prepared as well as traditional, social and mobile media that will be used disseminate information
- Lays out a general proposed schedule for these activities

Includes plans for updating the public on the status of the project

- Coordinating other briefings (for elected and municipal officials, for example);
- Providing strategic planning, coordination and staffing for public meetings



ROLES AND RESPONSIBILITIES

Project Schedule

- Project Schedules include both Construction and Design activities
- Cost-Resource Loaded Schedule
- Progress payments made based on completion of schedule activities
- Complex schedules with more interim milestones
- Often include Incentive/Disincentive clauses
  - Important to avoid owner directed changes that impact schedule whenever possible.
  - Allow Design-Builder flexibility to mitigate schedule risks

Project Submittals and Reviews

PROJECT SUBMITTALS AND REVIEWS

Design-Build Submittal and Review Process

Design-Builder submits to MassDOT for review

- Formal Design Submittals (75% Highway, 100% Highway, and Bridge Structural)
- Early Release Submittals
- Construction Submittals
- Quality Control Plans

MassDOT must respond within contractual timeframe – Typically 30 Days

- Increased need for collaboration throughout review

Keys to a successful review

- Productive Over-the-Shoulder Reviews
- Coordination between reviewers on outcomes

Submittal Distribution Matrix

- Project specific spreadsheet that lists all submittal types and individuals responsible for reviewing
- Created by the DB-PM at project initiation

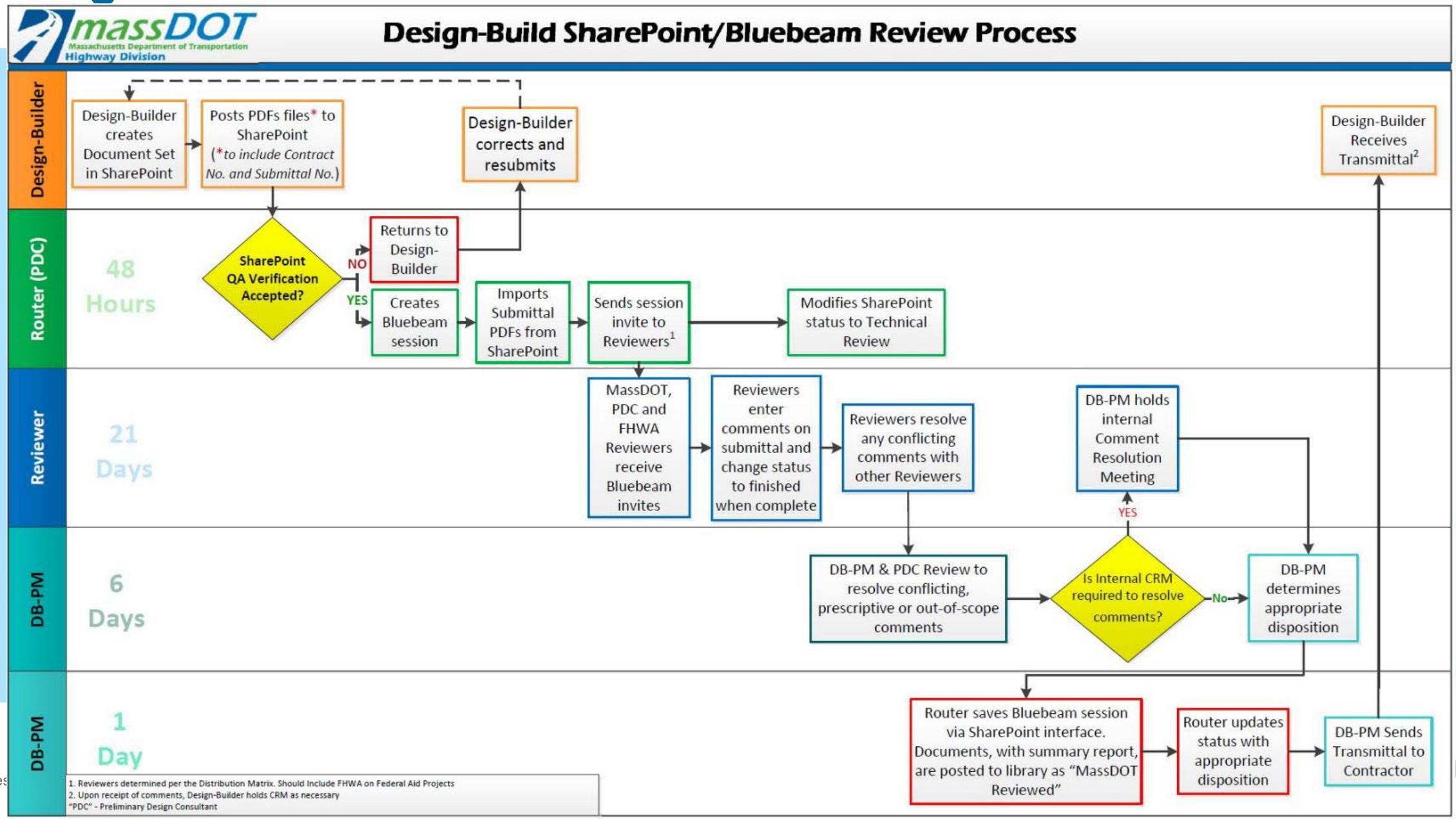
PROJECT SUBMITTALS AND REVIEWS

Submittal Distribution Matrix

Document Type	MassDOT Project			FHWA				MassDOT District 5 Design Reviewers						MassDOT District 5 Construction				
	Consultant (TranSystems) Paul Yu, Mike Reiger	**Owners Representative** rlittlefield@chappellengineering.com	**Project Manager** valerie.kilduff@dot.state.ma.us, Theodore.Boyle@dot.state.ma.us	**QC Engineer/Field Operations** Joshua.Grzegorzewski@dot.gov	**environmental protection specialist** cassandra.ostrander@dot.gov	**Structures Engineer** Michael.Arpino@dot.gov	**Major Projects Engineer** ken.coelho@dot.gov; fhwa-ma-eng@dot.gov	**District Design/Build and Major Projects Engineer** **Alex.Duggan@dot.state.ma.us**	**Projects** Pamela.Haznar@dot.state.ma.us(FIO), Richard.Bilski@dot.state.ma.us **(FIO)**	**Traffic** Kenneth.Charlton@dot.state.ma.us(FIO), David.Soares@dot.state.ma.us(FIO), Rebello, Thomas.Rebello@dot.state.ma.us	**Bridge** **david.mccombs@dot.state.ma.us** , Edmund.H.Newton@dot.state.ma.us, Shane.Sousa@dot.state.ma.us(FIO)	**D.U.C.E.** Richard.Bilski@dot.state.ma.us, Christopher.Betourney@dot.state.ma.us, Robert.Wheeler@dot.state.ma.us (FIO)	**Environmental** Andrea.Coates@dot.state.ma.us, Robert.Wheeler@dot.state.ma.us (FIO)	**Construction Engineer** Gerald.Bernard@dot.state.ma.us (FIO)	**Asst Construction Engineer** Michael.J.McGrath@dot.state.ma.us	**District Area Construction Engineer** Marc.Cardinal@dot.state.ma.us	**Resident Engineer/Field Office** Emanuel.F.Aguiar@dot.state.ma.us, Patrick.Arsenault@dot.state.ma.us,	**Materials** Jason.Lema@dot.state.ma.us
PROJECT MANAGEMENT																		
Project Management Plan (PMP)	BB	BB	BB				BB							E(I)	BB	BB	BB	
Project Schedules (Baseline Schedules, 3 Wk Look-Ahead, Cash Flow Projections)			E(I)				E(I)	E(I)	E(I)					E(I)	E	E	E	E(I)
Quality Management Plan (QMP)	BB	BB	BB	BB(I)			BB	BB			BB			E(I)	BB	BB	BB	BB
Contingency Plan	BB		E(I)				BB			BB	BB(I)			E(I)	BB	BB	BB	
Public Outreach Plan, Graphics & Project Website		BB(I)	BB				BB	BB(I)	BB(I)	BB(I)	BB(I)	BB(I)	BB(I)	E(I)	BB	BB	BB	
ENVIRONMENTAL																		
Environmental Permits/ Amendment Submittals	BB		E(I)		BB		BB						BB	E(I)	BB	BB	BB	
Hazardous Materials Management Plan			E(I)		BB		BB(I)						BB(I)	E(I)	BB	BB	BB	
Soil & Groundwater Management (SGMP) Plan			E(I)		BB		BB(I)						BB	E(I)	BB	BB	BB	
Health & Safety (HASP) Plan			E(I)		BB		BB(I)						BB(I)	E(I)	BB	BB	BB	
SWPPP Plan	BB		E(I)		BB		BB(I)						BB	E(I)	BB	BB	BB	
Lead Containment Plan			E(I)		BB		BB(I)						BB(I)	E(I)	BB	BB	BB	
Dust Control Plan			E(I)		BB		BB(I)						BB	E(I)	BB	BB	BB	

PROJECT SUBMITTALS AND REVIEWS

Design-Build Reviews – Best Practices



PROJECT SUBMITTALS AND REVIEWS

Design-Build Reviews – Best Practices

Avoiding Prescriptive Requirements or Design Direction

- Transfers risk and accountability back to MassDOT
- Restricts opportunities for creative solutions
- Reduces the Design-Builder's ability to control cost

Greater the Risk – Greater the Oversight

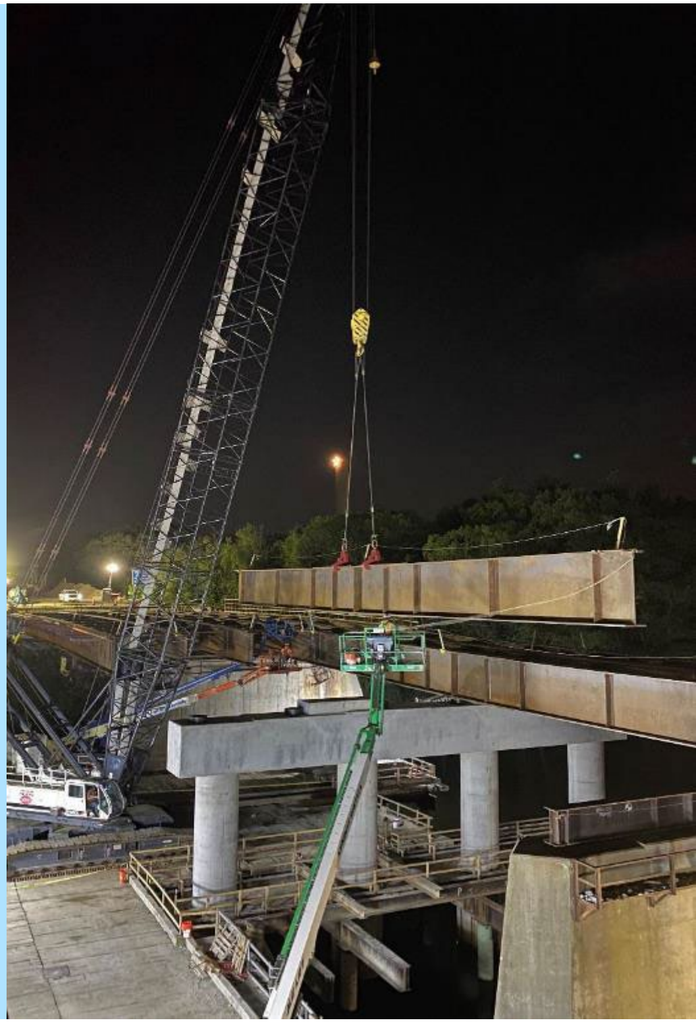
Technical Reviewers role is to evaluate submissions based on RFP and Technical Proposal

- Is Design-Builders proposed solution "Equal or Better"

Avoid Preferential of Prescriptive comments outside RFP criteria

- These comments need to be resolved before returning submission to Design-Builder
- Commercial and Schedule impacts need to be assessed
- Reviewers must allow for flexibility within the design parameters

Is the Design-Builders Solution Technically Feasible?



PROJECT SUBMITTALS AND REVIEWS

Over-The-Shoulder (OTS) Meetings

What?	Provide guidance during final Design Development
Why?	Assist in expediting submittal review process
Who?	Design-Builder, MassDOT Reviewers & PDC
When?	Required Prior to Formal Submission
How?	In Person (recommended) or virtual roundtable discussion

PROJECT SUBMITTALS AND REVIEWS

OTS Meeting Minutes & Comments

Timely and accurate meeting minutes are critical

Meeting minutes should be included as part of formal submissions

- This allows reviewers that were unable to attend to make themselves aware of the issues discussed

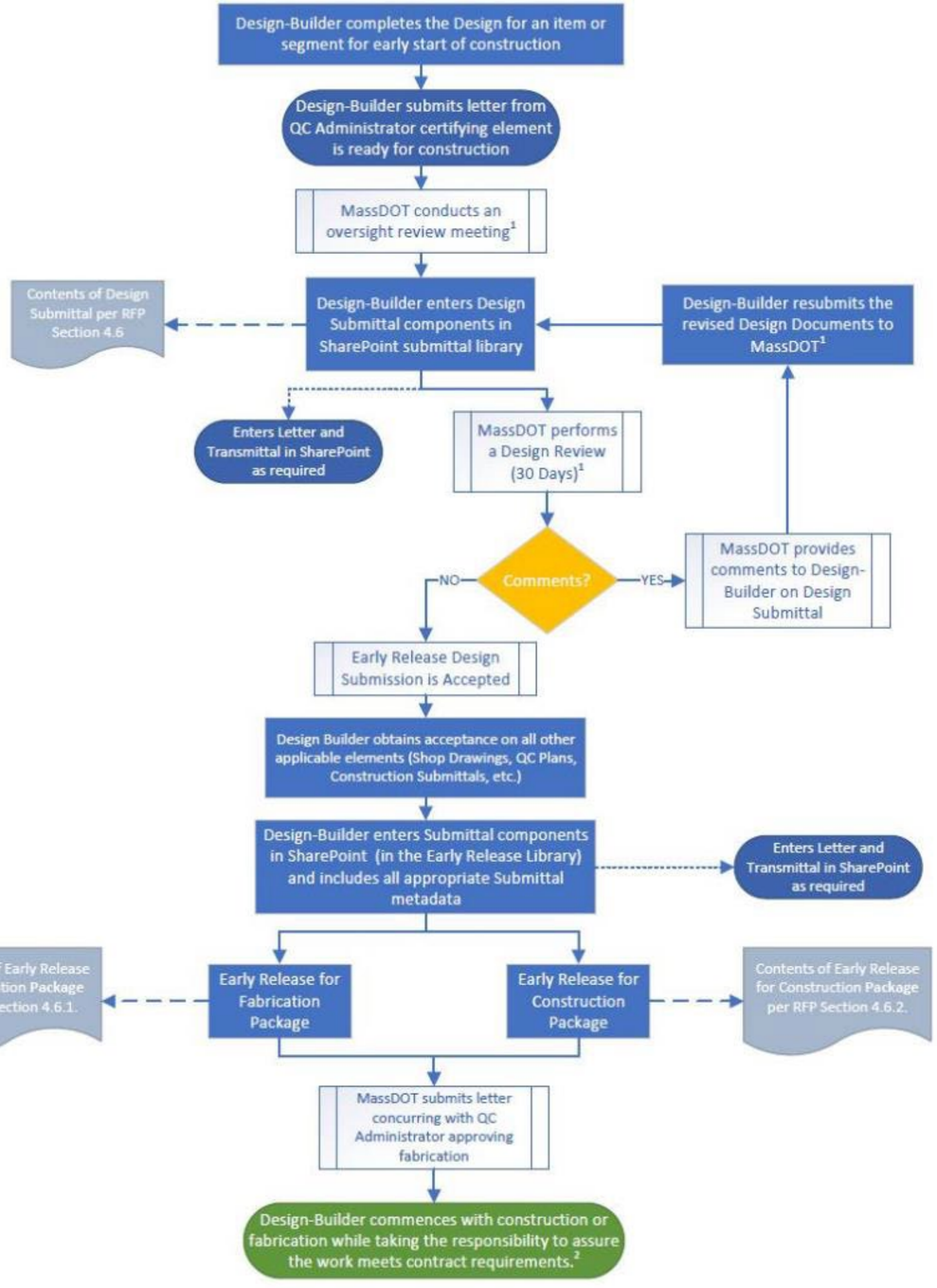
Best Practice – An effective tool is to track comments and provide responses on how the issue was/will be addressed

Deliverable1	OTS Date	ID	Sheet Name	Sheet No	Commenter Org	Comment By	Comment	Response	Response Status	Resp Status KPI	Resolved	Verified Initials	Item Open / Closed	Item KPI
75% Highway	10/10/2018	119			MASSDOT	Ernie M.	Special Borrow notes on the Pavement Notes were discussed. Installing 24" Special Borrow in all locations creates a constructability challenge with little to no added value. Special Borrow should only be used only where unsuitable materials are found.	It was agreed that where the pavement notes specify special borrow, it should state "where unsuitable material exists." 75% Plans will be revised accordingly.	Final	✓	Yes	CRS	Closed	✓
		120			MASSDOT	Koby	It was discussed that thrie beam guardrail is no longer used by MassDOT.	GUARDRAIL, TL-3 (SINGLE FACED) will be specified on the 75% Plans	Final	✓	Yes	CRS	Closed	✓

PROJECT SUBMITTALS AND REVIEWS

Early Release Packages

- Develop the design of specific elements of the project to a level where Fabrication or Construction can progress prior to the final design.
- Design-Builder to include cover letter/description of items included, and not included in ERC packages
- The DB contract details the processes for design, review, and approval of Early Start of Construction packages.
- Upon Acceptance of the Early Release Package, the Design-Builder may proceed with Fabrication, Material Procurement of Construction
- Critical in overall project schedule and success
- Any RFI, NCR, DR or Material Failures are tracked and linked directly via the Early Release for Construction to the 100% Design Submittal Package.


Design-Builder completes the Design for an item or segment for early start of construction
Design-Builder submits letter from QC Administrator certifying element is ready for construction
MassDOT conducts an oversight review meeting[1]
Contents of Design Submittal per RFP Section 4.6
Design-Builder enters Design Submittal components in SharePoint submittal library
Design-Builder resubmits the revised Design Documents to MassDOT[1]
Enters Letter and Transmittal in SharePoint as required
MassDOT performs a Design Review (30 Days)[1]
Comments?
NO
YES
MassDOT provides comments to Design-Builder on Design Submittal
Early Release Design Submission is Accepted
Design Builder obtains acceptance on all other applicable elements (Shop Drawings, QC Plans, Construction Submittals, etc.)
Design-Builder enters Submittal components in SharePoint (in the Early Release Library) and includes all appropriate Submittal metadata
Enters Letter and Transmittal in SharePoint as required
Contents of Early Release for Fabrication Package per RFP Section 4.6.1.
Early Release for Fabrication Package
Early Release for Construction Package
Contents of Early Release for Construction Package per RFP Section 4.6.2.
MassDOT submits letter concurring with QC Administrator approving fabrication
Design-Builder commences with construction or fabrication while taking the responsibility to assure the work meets contract requirements.[2]

PROJECT SUBMITTALS AND REVIEWS

Requests for Information

Questions from Lead contractor to their designer

- Design-Builder’s Designer to provide response. MassDOT must concur with responses

Questions from Design-Builder to MassDOT

- Answered by PDC/Resident Engineer/Project Manager

RFI responses do not necessarily constitute an EWO/EOT

Categories:

- Clarification, Minor Change, Additional Information
- Changes to BTC/Technical Proposal require more justification and receive a more in-depth review to ensure the Design-Builder provides “equal to or better” than BTC

RFIs are not substitutes for NCRs (Check with RFP)

PROJECT SUBMITTALS AND REVIEWS

Issued for Construction Drawings

- Design-Builder shall confirm all comments concerning the Final Design have been resolved prior to submission of the “Issued for Construction” Plans
- Posted to SharePoint site to the Issued for Construction Library
- The IFC plans must be stamped by the Engineer of Record before posting to the Library
- IFC Drawings supersede all ERC packages and shall include all accepted revisions to date

PROJECT QUALITY ASSURANCE

Design Change Notices and Field Design Changes

Additional processes in DB projects to facilitate plan revisions:

Design Change Notice (DCN) – Utilized when the Design-Builder requests to change a previously approved Issued for Construction Drawing (before construction has begun on that element)

Field Design Change (FDC) are design changes necessitated by an NCR or changed field condition

FDCs & DCNs must be reviewed by MassDOT and FHWA for acceptance similar to any other design submission

Any plans, specifications, shop drawings, etc., that are updated as part of these processes, need to be reissued to all construction personnel prior to work taking place

Construction Procedures and Shop Drawings

CONSTRUCTION PROCEDURES AND SHOP DRAWINGS

Construction Procedures

Construction Procedures that have the potential to impact public safety shall be reviewed and approved by the Design-Builders Lead Engineering Firm and submitted to MassDOT for review and acceptance

Examples of Construction Submittals

- Erection Plans
- Demolition Plans
- Support of Excavation
- Environmental Compliance
- Construction Monitoring Plans
- Other Documentation (RFP 10.14)
- AND as Deemed Necessary

CONSTRUCTION PROCEDURES AND SHOP DRAWINGS

Accepted Shop Drawings

Drawing or set of drawings prepared by the fabricator

- Submitted to the Design-Builder and reviewed and approved by the Engineer of Record (EOR).
- When Accepted they are uploaded to the appropriate library in Share Point and sent via E-Mail to R&M or Metals as appropriate

The Design-Builder's EOR is the primary reviewer for shop drawings.

Shop drawings must go through the QMP design review process

MassDOT and PDC only review shop drawings for completeness of package

Design-Build Fabrication Quality Assurance Process

massDOT Massachusetts Department of Transportation Highway Division

Design-Builder

Design-Builder obtains acceptance on design (Early Release or IFC) → Design-Builder Fabricator sends Shop Drawings to DB Designer → D-B Designer reviews and stamps shop drawings (QC in accordance with QMP)[1] → Design-Builder distributes stamped shop drawings to SharePoint shop drawing library

Shop Drawing Distribution

48 Hours

MassDOT Verification → PDC reviews submission for completeness; PDC forwards to R&M or Metals Control for concurrent review

Comments on Shop Drawing? YES → (back to Design-Builder)

Comments on Shop Drawing? NO → Released for fabrication

Released for fabrication → If Early Release Design-Builder posts shop drawings to Early Release Libriary

Released for fabrication → R&M or Metals Control distributes shop drawings to plant inspector

Field

Fabricated item is installed → installation in accordance with QC Plan; MassDOT ensures QC is adequate, confirms specifications are meet → Acceptance[2]

1. Design-Builder is encouraged to coordinate with MassDOT if questions arise during shop drawing reviews
2. If at any stage after a Non-Conformance is discovered by Fabricator QC Staff, Design-Builder QC Staff or MassDOT representatives, an NCR should be initiated immediately.

CONSTRUCTION PROCEDURES AND SHOP DRAWINGS

Contract Amendments

What is a Contract Amendment?

- Reasons
  - Scope Changes
  - Differing Site Conditions

Implementation of Contract Amendments

- EWOs are reviewed with Design and Construction costs
  - Engineering costs have audited overhead rates (See contract language)

Project Quality Assurance

PROJECT QUALITY ASSURANCE

Construction Quality Control

Design-Builder's Responsibility

- Design-Builder may utilize consultants to assist in Quality Control activities

Quality Control Administrator

- Responsible for all QC activities on the project (Design and Construction)

Construction QC Manager

- Full time Key Personnel responsible for managing implementation of QC Plans
- Requirements include NETTCP Certification and a combination of experience and education

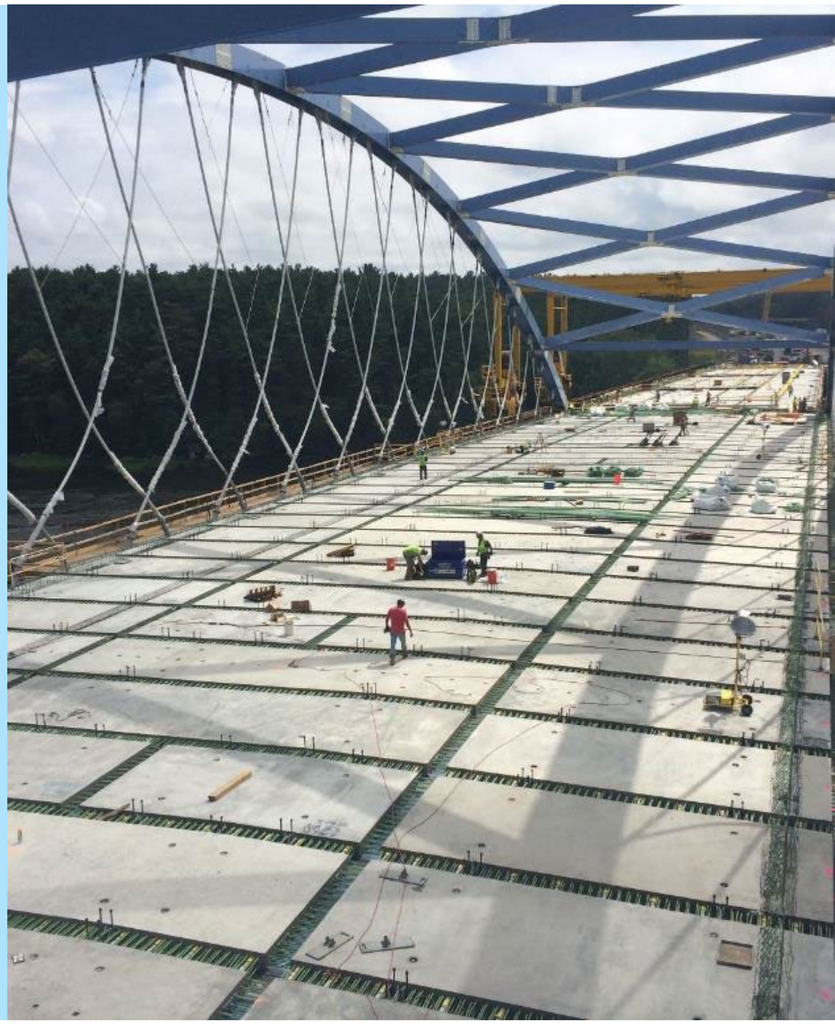
Fabrication Quality Control Manager

- Independent from the MassDOT Consultant Inspector
- Ensures that the Fabricator is meeting the requirements of the QSM
- Certified by AWS or PCI w/ 10 years experience
- Approves fabrication procedures for MassDOT acceptance

QC Plans submitted for each major work item outline:

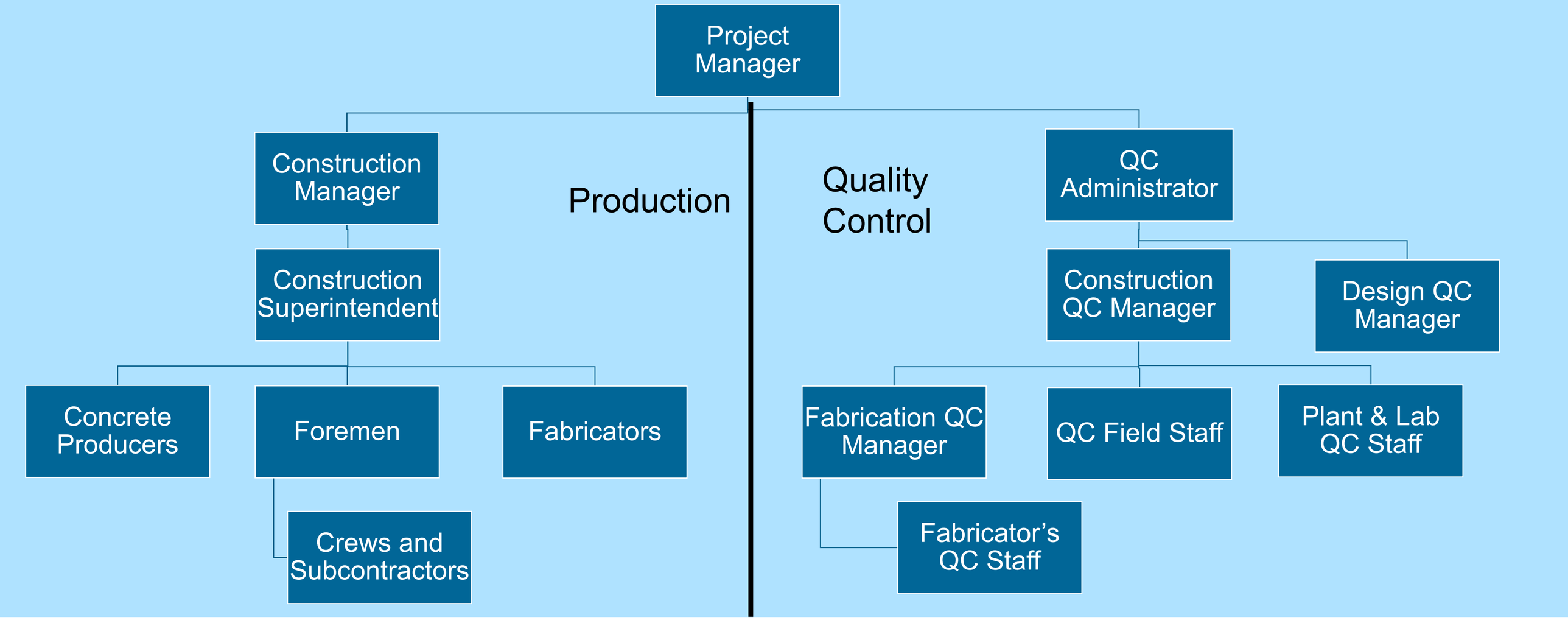
- QC Sampling and Testing frequencies (shall be no less than MassDOT acceptance frequency).
- Inspection attributes and frequency of inspection

Maintain daily and monthly QC logs on SharePoint



PROJECT QUALITY ASSURANCE

Quality Control Structure



PROJECT QUALITY ASSURANCE

Quality Control Structure

Production Personnel

- Should perform “Frontline QC” activities - QC “self-checks” or “self-inspection” throughout the process of work production.
- Should receive initial training on the Quality Control procedures in the Quality Management Plan under the direction of the QC Administrator and “Formal QC” Team staff.

Formal Quality Control

- Formal QC inspection and testing performed independently of Construction Production Personnel by the Construction QC Team staff.
- Constantly monitor and measure each production or placement process in order to determine if it is in control and providing a product that is in conformance with requirements.

PROJECT QUALITY ASSURANCE

Quality Control

QC Plans are identified in the QMP for Major Items of Work such as:

- Hot Mix Asphalt
- Earthwork
- Precast Concrete (PCC)
- Bridge Superstructure- Structural Steel
- Drainage
- Prefabricated Elements

PROJECT QUALITY ASSURANCE

Fabrication Quality Control

Fabrication QC Manager Shall:

Be Certified As:

- CWI for Steel Fabrication
- Level I by PCI for Precast Concrete

Oversee implementation of fabricator's QSM

Review Fabrication Procedures to ensure conformance to Specifications

Identify and Document Non-Conformances and Oversee Resolution

Design-Build Fabrication Quality Assurance Process

massDOT Massachusetts Department of Transportation Highway Division

D-B Designer | Design-Builder

Fabrication Begins

Fabrication QC Manager oversees fabrication Quality Control Activities

MassDOT representative performs acceptance inspection at facility

Fabrication Complete

MassDOT representative releases fabricated item to ship

DB QC team performs Material Receiving Inspection

Fabricated item is installed

QC staff ensures installation in accordance with QC Plan

MassDOT ensures QC is adequate, confirms specifications are meet

Acceptance[2]

uring shop drawing reviews
esign-Builder QC Staff or

MassDOT representatives, an NCR should be initiated immediately.

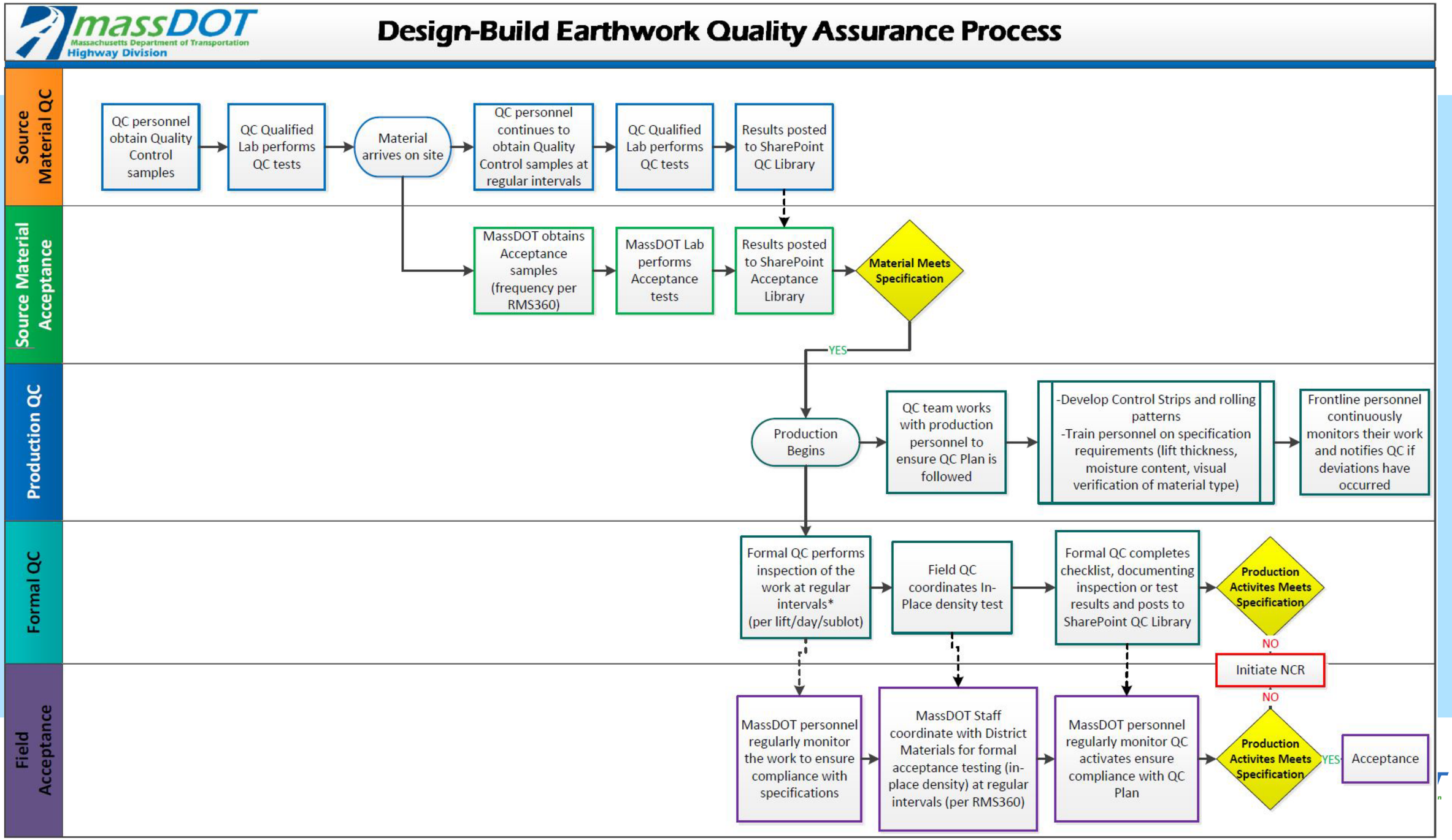
PROJECT QUALITY ASSURANCE

Construction Quality Control

Formal Construction Quality Control:

- Ensure Implementation of Quality Control Plan
- Perform Material Receiving Inspection Reports
- Ensure Material Delivered to the site has corresponding Documentation (COC, Mill Cert, etc.)
- Perform Inspections in Accordance with QC Plan
  - Equipment
  - Materials
  - Environmental Conditions
  - Workmanship
- Document Inspections/Testing on QC Inspection or Testing Report Forms
- Ensure Proper QC Sampling and Testing Independent of Acceptance Sampling and Testing
- Identify and Documenting Non-Conformances and Oversee Resolution
- Design-Builder Required to Submit “Materials & Workmanship Quality Certificate” upon Completion of Project

PROJECT QUALITY ASSURANCE



PROJECT QUALITY ASSURANCE

MassDOT Acceptance

- Inspection (Plant and Field)
- Confirming that the Design-Builder is following their QMP and QC Plans.
- Testing and Sampling Frequency per MassDOT RMS360
- Acceptance of construction still rests with MassDOT

PROJECT QUALITY ASSURANCE

Non-Conformance Reports (NCRs)

What is an NCR?

- Non-Conformance to Contract specifications and standards
- Non-Conformance to QMP

Who Initiates an NCR

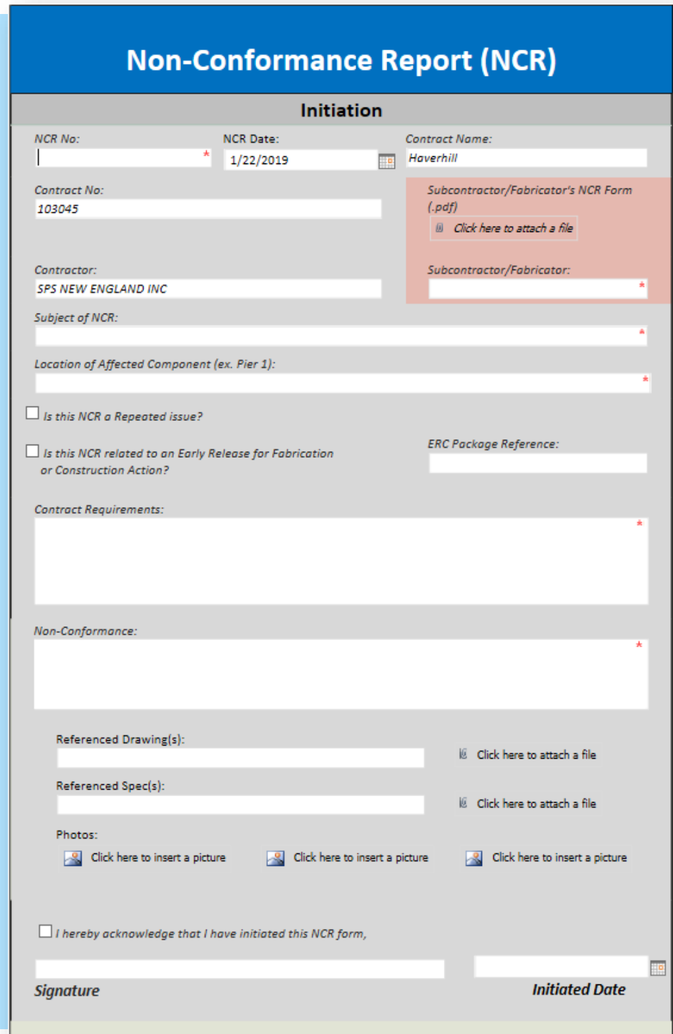
- Based on QMP the expectation is that the DB team identifies and initiates NCRs
- MassDOT can also initiate NCRs

Types of NCRs

- Field
- Fabrication Steel
- Fabrication Precast
- Fabrication Other
- Other

Avoiding Repeat NCRs

- Quantity of NCRs alone is **not** a good measure of Quality Control performance


Non-Conformance Report (NCR)

Initiation

NCR No: *

NCR Date: 1/22/2019

Contract Name: Haverhill

Contract No: 103045

Subcontractor/Fabricator's NCR Form (.pdf)

Click here to attach a file

Contractor: SPS NEW ENGLAND INC

Subcontractor/Fabricator: *

Subject of NCR: *

Location of Affected Component (ex. Pier 1): *

☐ Is this NCR a Repeated issue?

☐ Is this NCR related to an Early Release for Fabrication or Construction Action?

ERC Package Reference:

Contract Requirements: *

Non-Conformance: *

Referenced Drawing(s):

Click here to attach a file

Referenced Spec(s):

Click here to attach a file

Photos:

Click here to insert a picture | Click here to insert a picture | Click here to insert a picture

☐ I hereby acknowledge that I have initiated this NCR form,

Signature

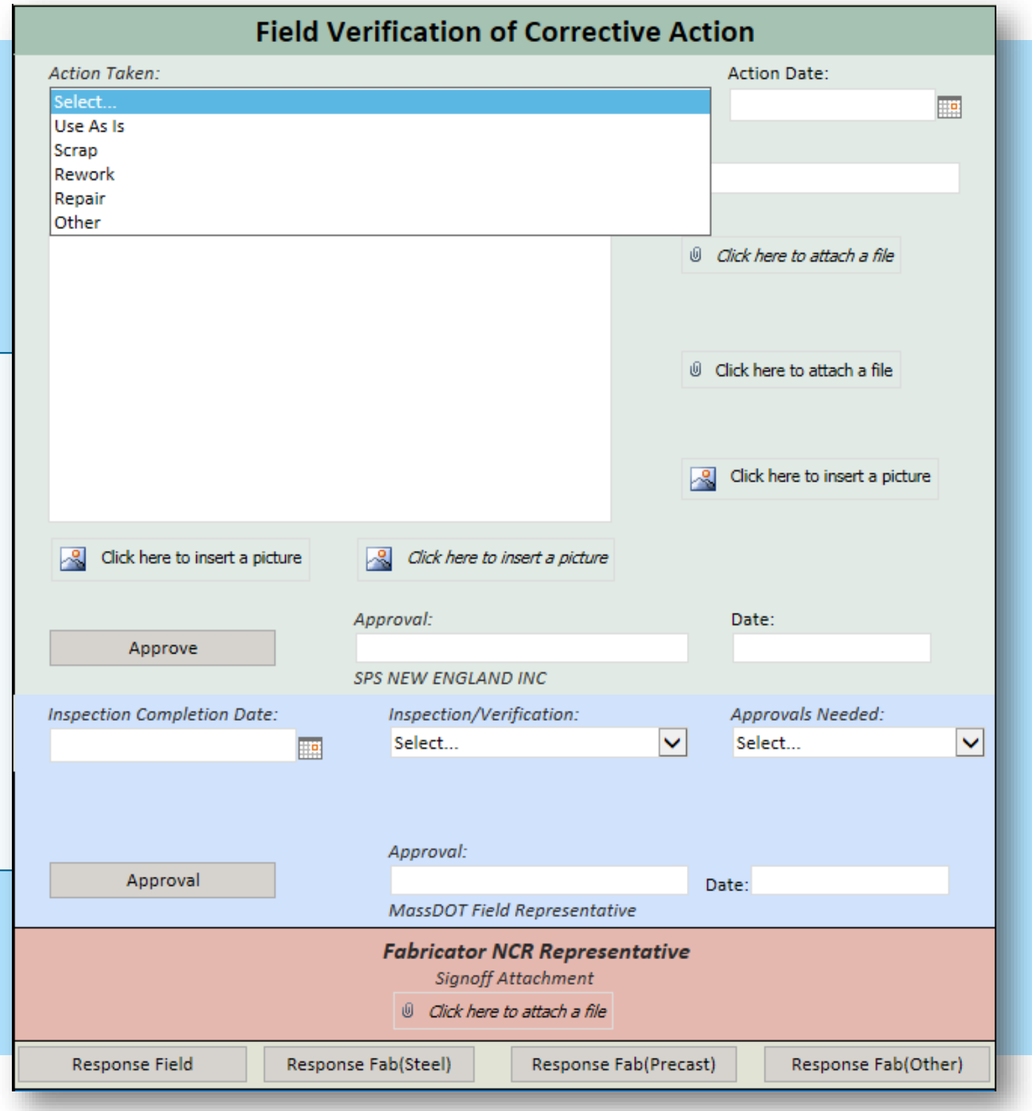
Initiated Date

PROJECT QUALITY ASSURANCE

Non-Conformance Reports (NCRs)

MassDOT Field Verification with D-B Entity to ensure Corrective Action Taken

- Use As Is (with credit)
- Scrap
- Rework
- Repair
- Other

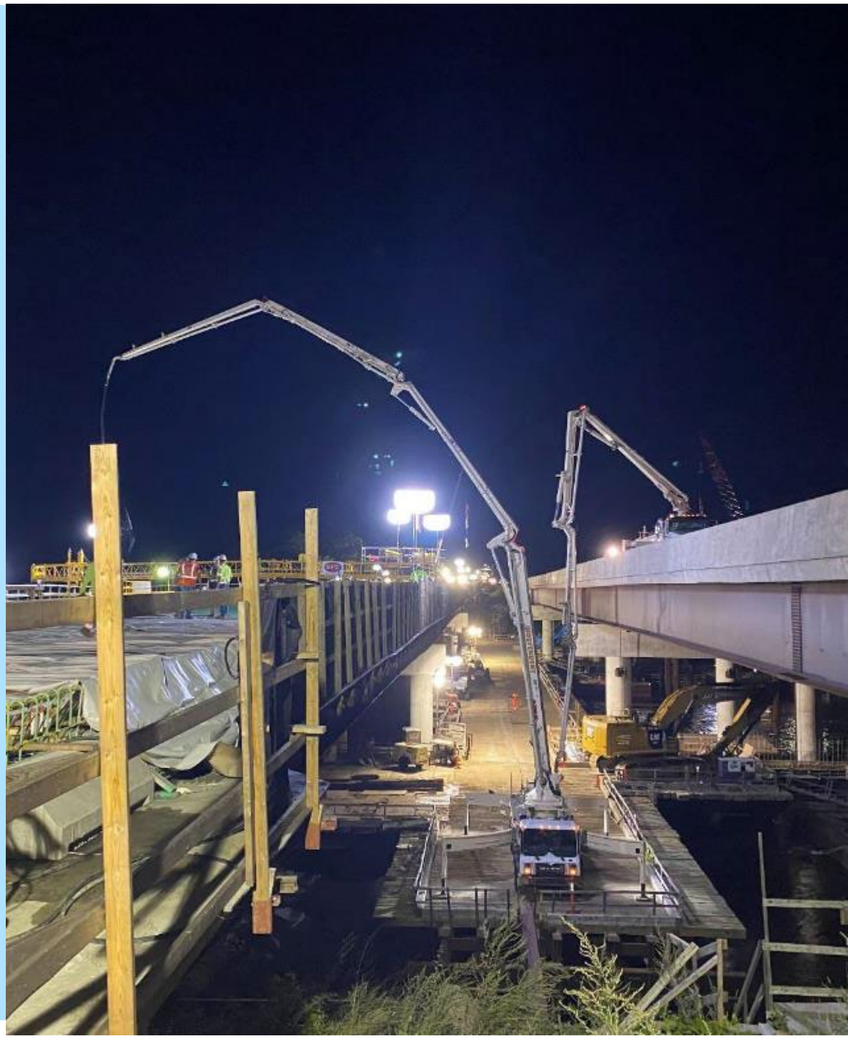


Lessons Learned

- Identify best reviewers for each submission (Design Submissions, QMP, QC Plans)
- Baseline Schedule should include all design activities and appropriate review durations
- Design-Builder needs to plan and prioritize to allow full review durations - Expedited reviews should not be expected
- Submissions should be complete, and in accordance with QMP and Design Schedule (no piecemeal submissions)
- Many instances of EOR approving Shop Drawings then Design changes occur and changes not incorporated into Shop Drawings
- EEO Compliance - Design Consultants also included
- Conduct Post-Construction Lessons Learned Workshops

Lessons Learned – Quality Control and Materials

- Embracing and Understanding Quality Assurance Principles
- DB typically has more non-standard items making the RMS360 more complicated
- Important to develop RMS360 early in construction and update often as quantities change
- Approving new materials/mix designs time consuming – clearly flag new products and plan ahead
- Ensure receipt of Material Receiving Inspection Reports per QMP
- Design-Builders should not proceed at own risk with fabrication



Discussion

Open discussion

Questions

Comments

Suggestions

Feedback