



Massachusetts Bay
Transportation Authority



North Station Draw One Bridge Replacement
Draw 1 – Industry Forum



November 18, 2024

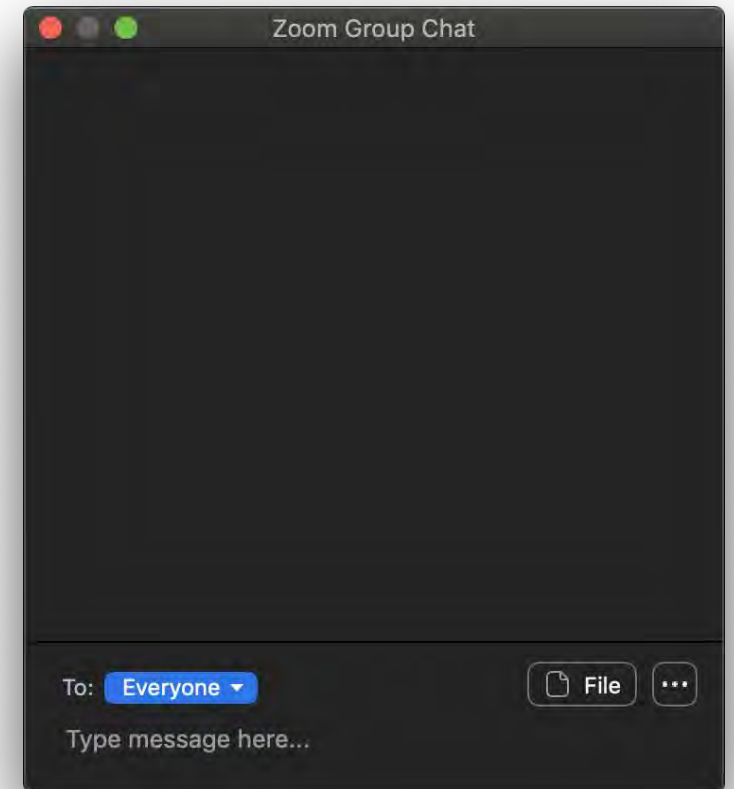
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To speak,
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Send a chat
to the moderator

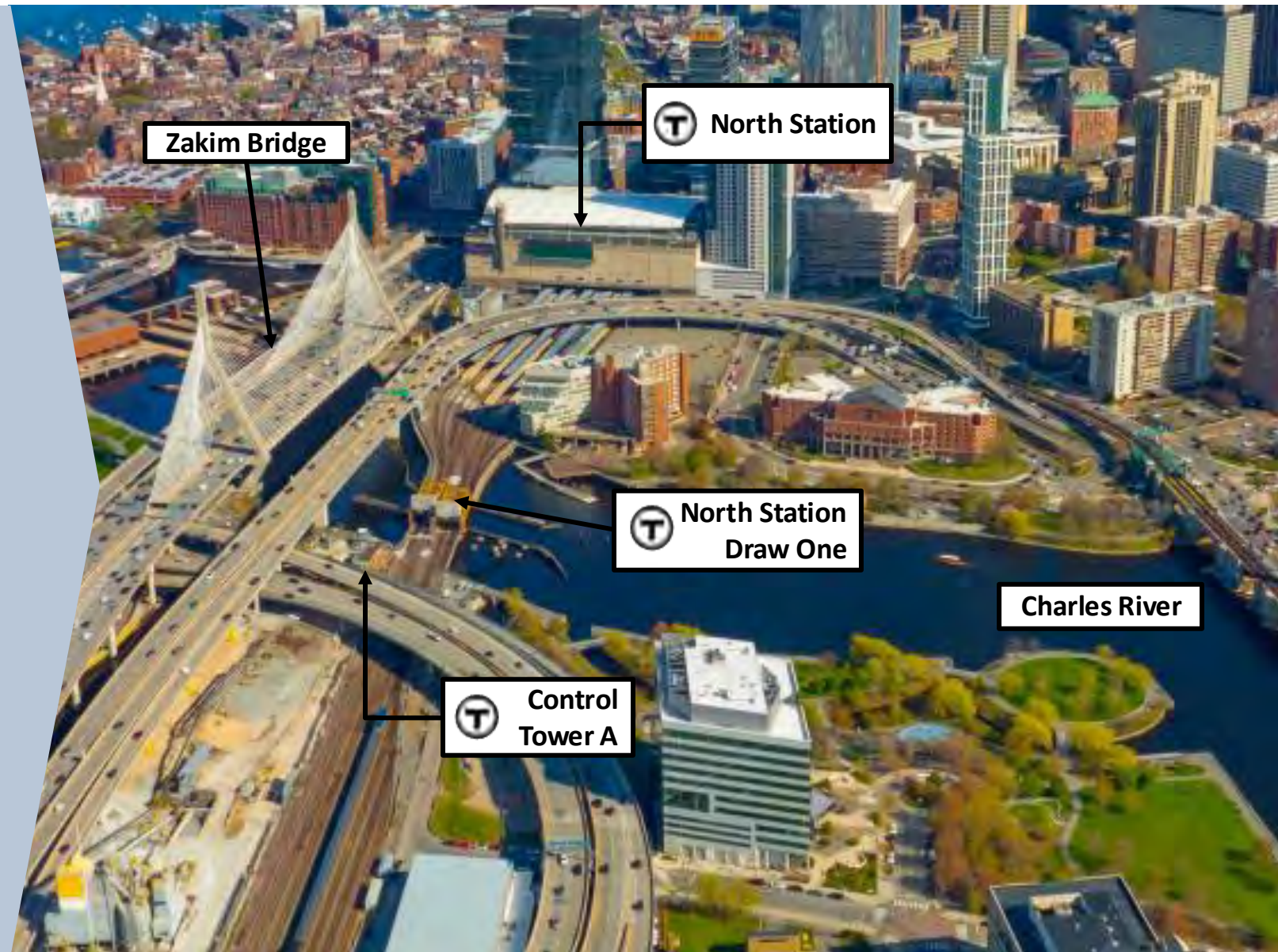


***9**
Raise Hand



Agenda

- Opening Remarks
- Draw One Program Presentation
- Questions



Opening Remarks

- Phillip Eng, PE General Manager (Video)
- Peter Butler FTA Region 1 Administrator
- Michael Muller MBTA Executive Director of Commuter Rail
- Sam Zhou, PE MBTA Assistant GM & Chief Engineer



Presentation

- Why It Is Needed
- Program Goals
- Program Description
- Challenges
- Funding
- NEPA Review
- Afternoon Site Tour

Karl Eckstrom, PE, MBTA PM
Mark Ennis, PE, STV PM



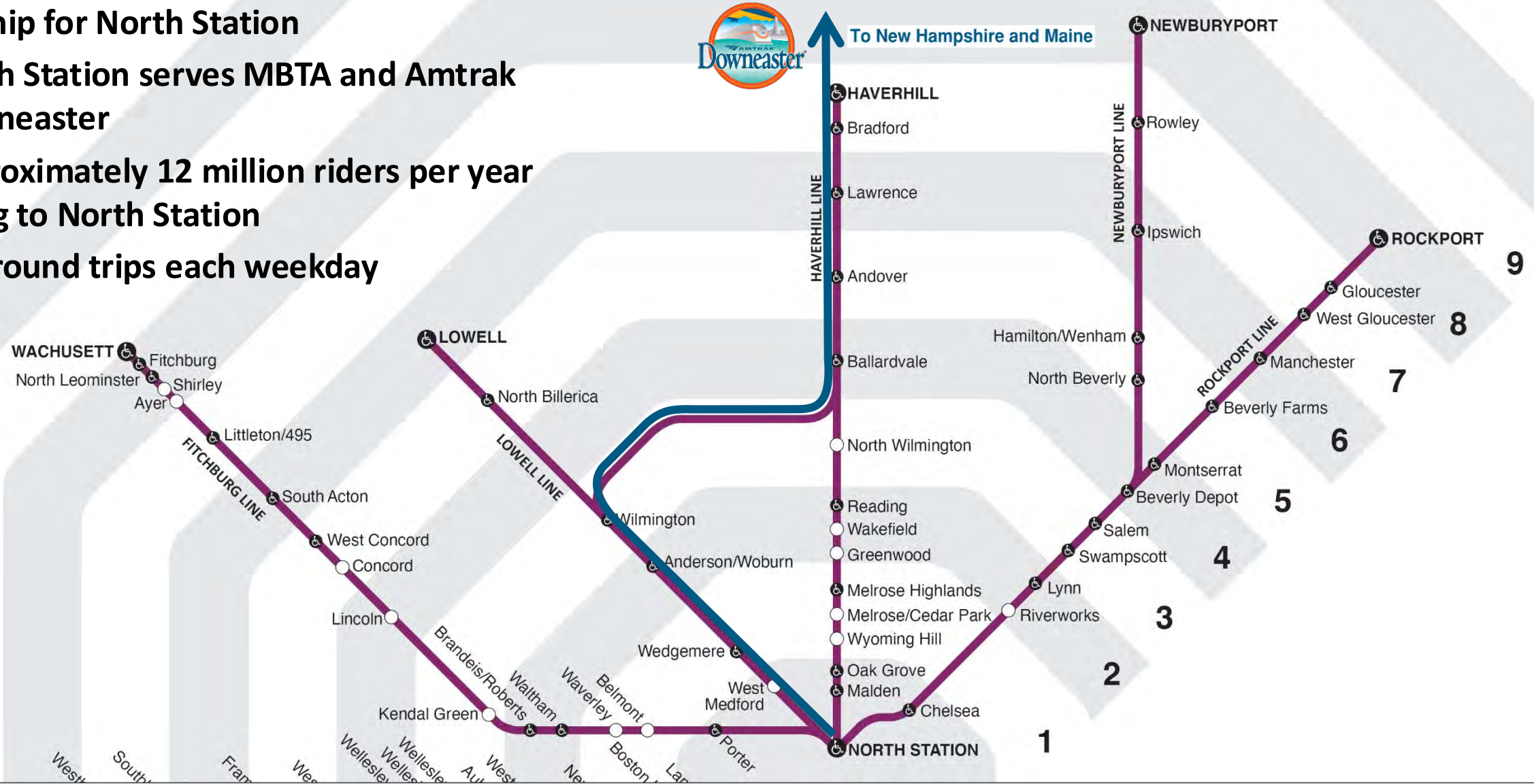
North Station Draw One Bridge Replacement Program

Why It Is Needed

Program Need – Public Access

Ridership for North Station

- North Station serves MBTA and Amtrak Downeaster
- Approximately 12 million riders per year going to North Station
- 100 round trips each weekday



Program Need – Existing Condition

Structural Evaluation

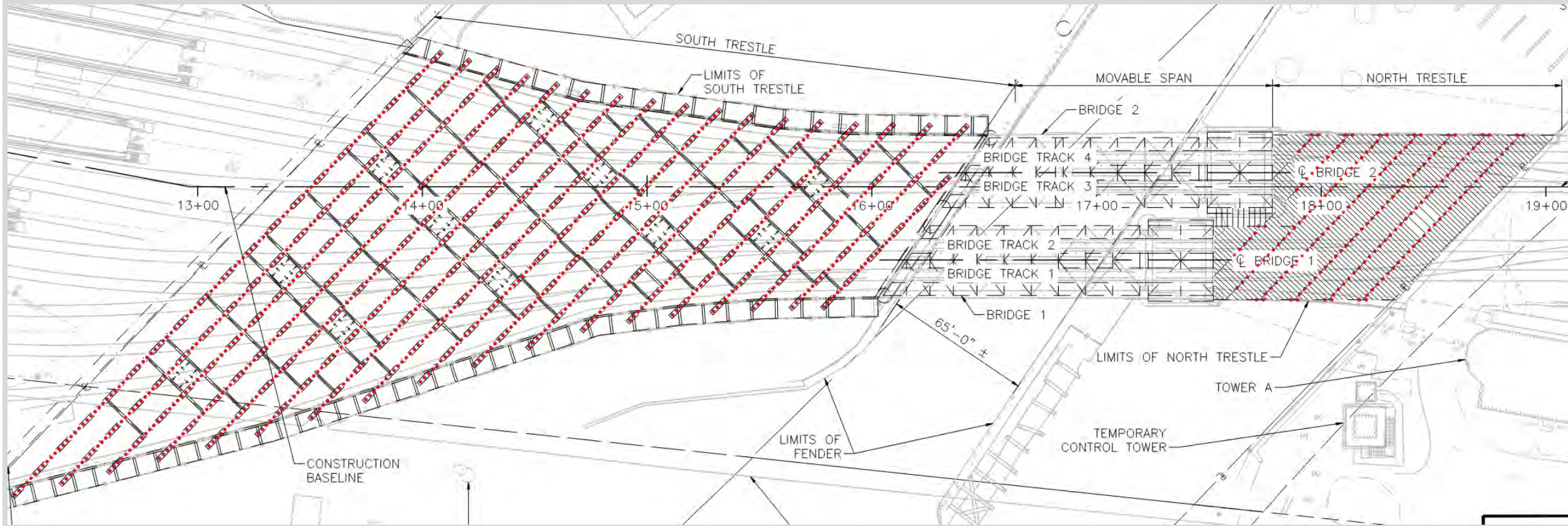
- 20 years beyond Design Life
- Fatigue life of steel members exceeded
- Rising cost of maintenance
- Bridge replacement required



Program Need – Existing Condition

Structural Evaluation

- Approximately 1400 existing timber piles at end of useful life



Program Need – On-Going Maintenance Work

- Movable Spans ‘walking’ out of alignment
- Relocation of Electrical Equipment out of Tower A
- Segmental Girder Strengthening
- Other Movable Span Steel Repairs
- Timber Trestle Repairs



North Station Draw One Bridge Replacement Program

Program Goals

Program Goals

- Modernize signal system
- Improve track availability in North Station by extending a platform and adding 2 tracks
- Enable more operational flexibility for north corridor
- Improve service reliability by accommodating more frequent trains
- This program is vital to maintain the current service as well as to improve service in the future



North Station Draw One Bridge Replacement Program

Program Description

Program Overview - Existing Site

DCR PARK

A

BOSTON SAND & GRAVEL

B

NORTH BANK BRIDGE

C

TOWER A

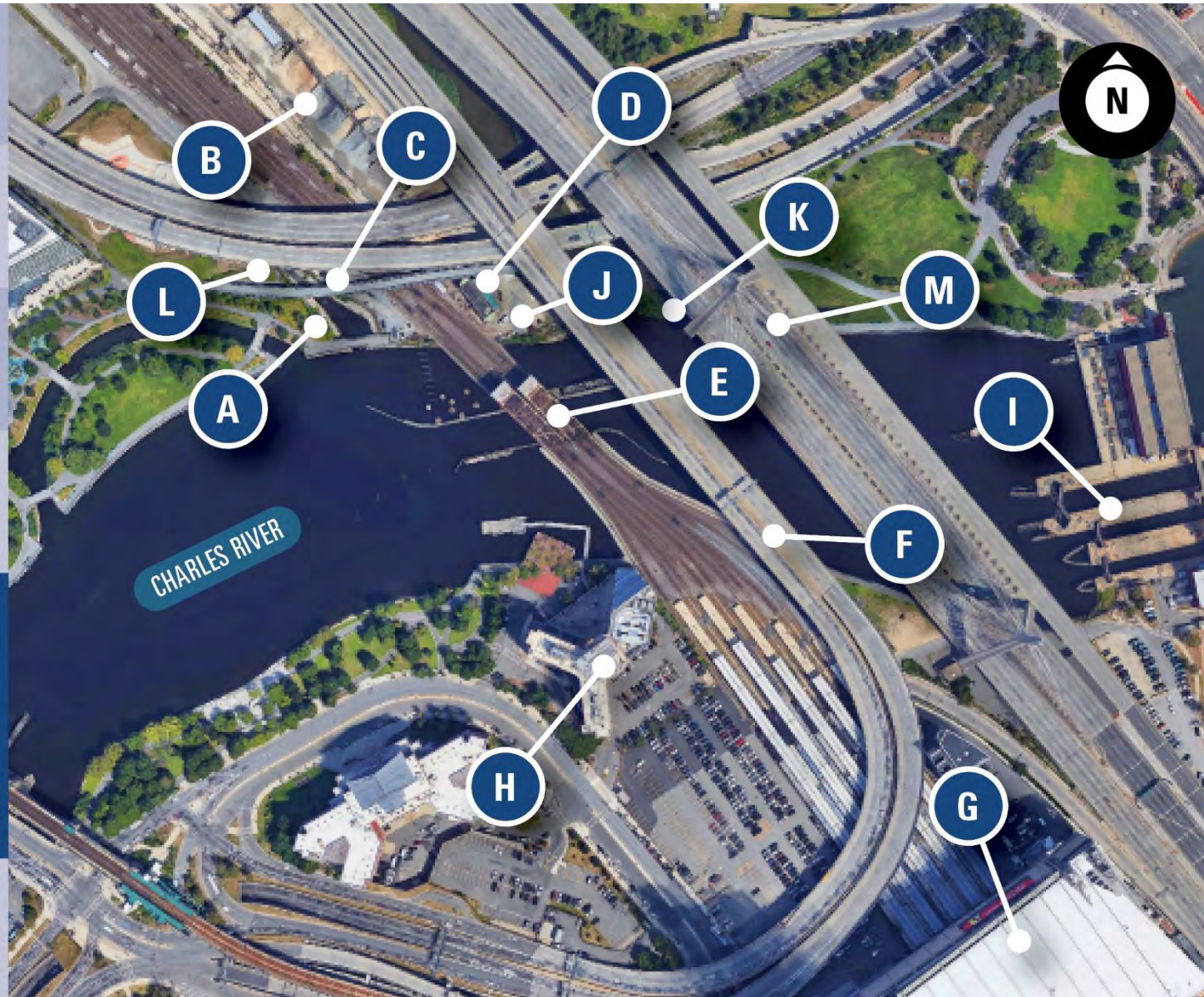
D

DRAW 1 BRIDGES

E

LEVERETT CIRCLE CONNECTOR BRIDGE

F



G

NORTH STATION

H

MGH BUILDING
(FORMERLY SPAULDING REHAB)

I

CHARLES RIVER DAM

J

TEMPORARY STEEL FRAME CONTROL TOWER

K

MILLERS RIVER

L

DUCK BOAT RAMP

M

ZAKIM BRIDGE

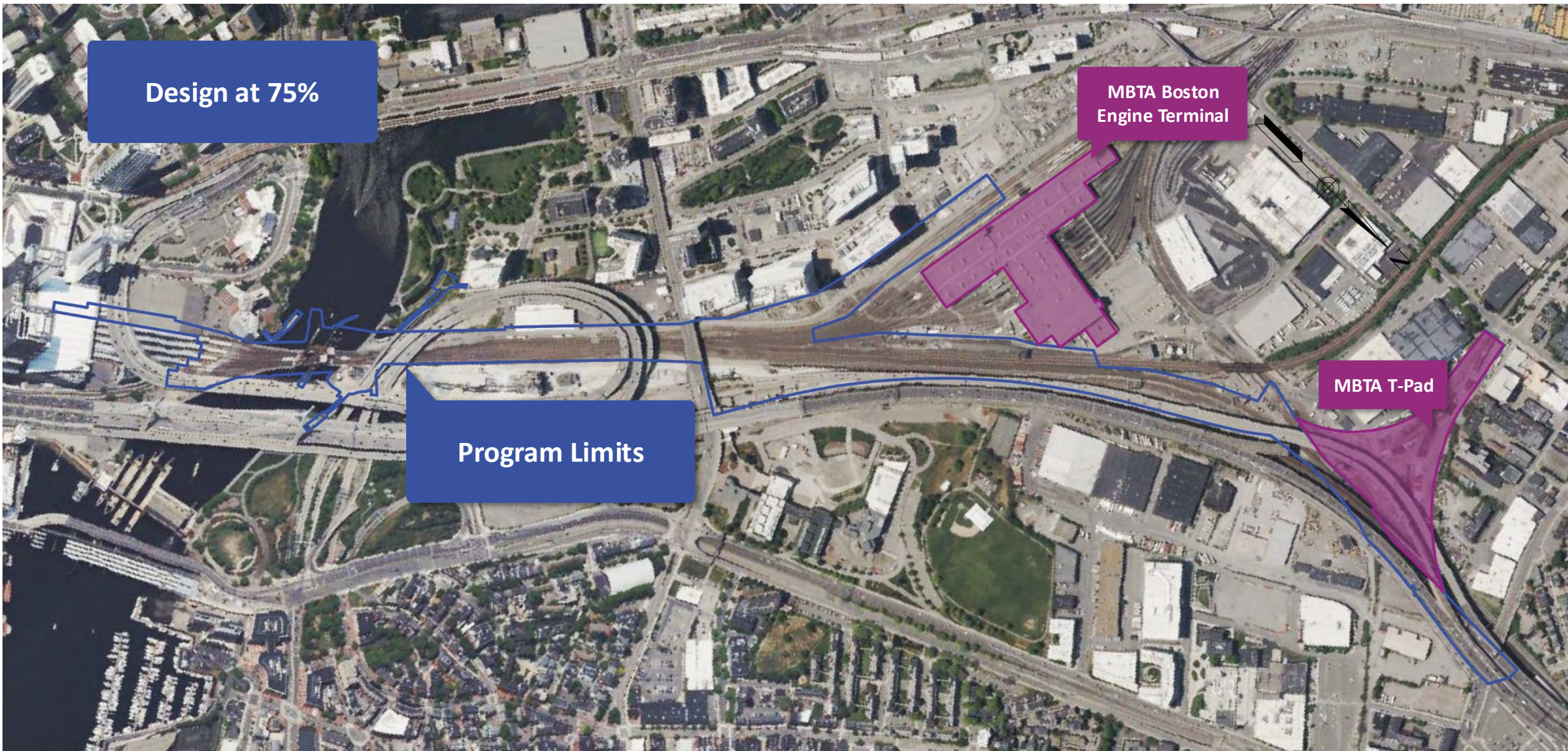
Program Overview – Program Limits

Design at 75%

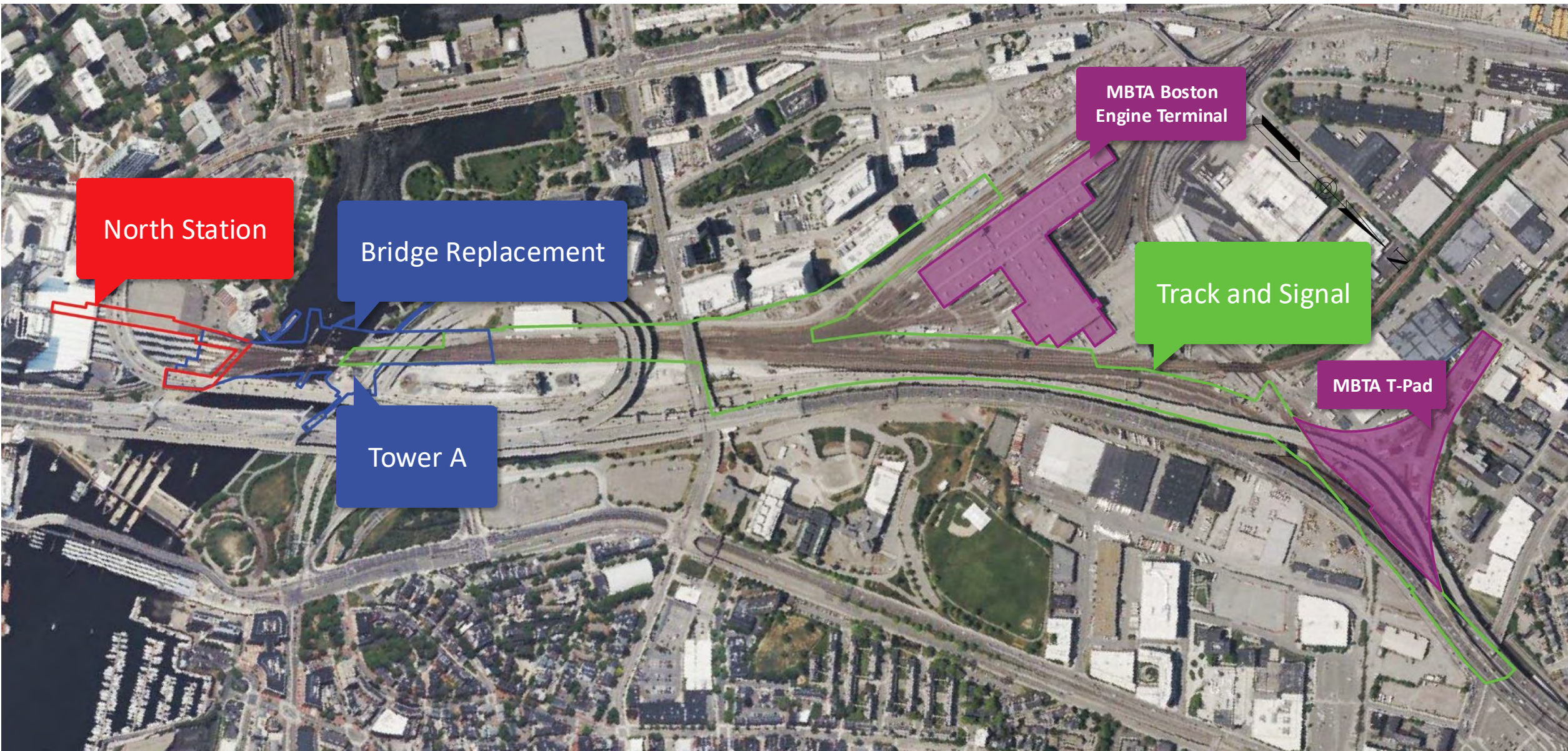
Program Limits

MBTA Boston
Engine Terminal

MBTA T-Pad



Program Overview – Key Elements

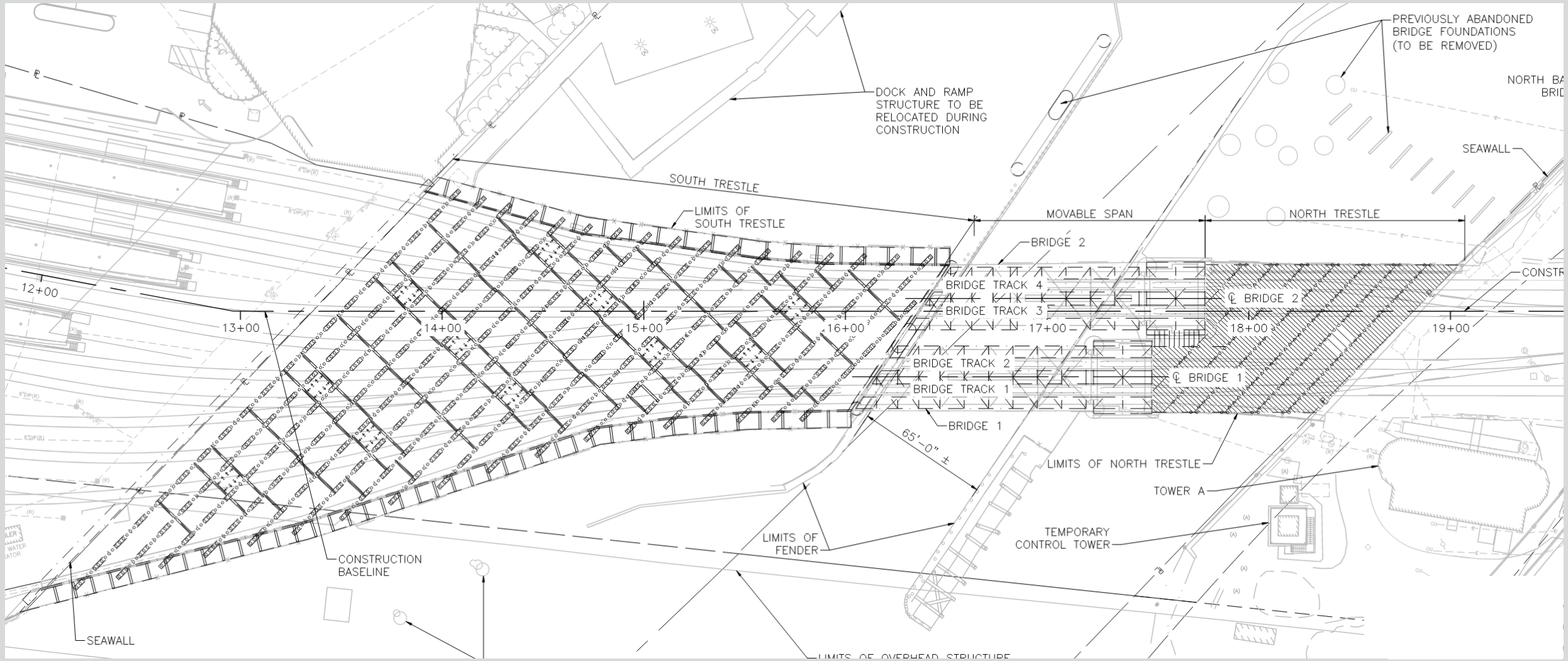


Program Scope – Bridge Replacement

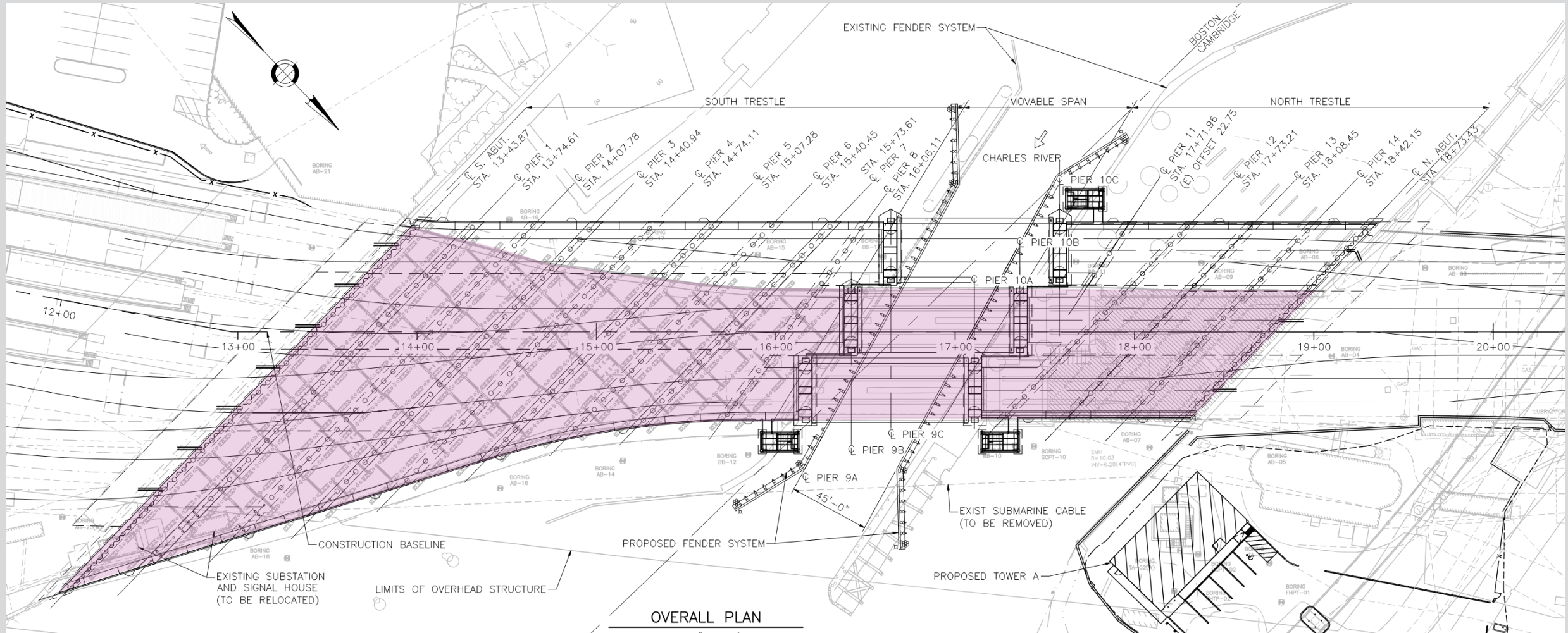
- Bridge Replacement
 - Replacement of 2 draw spans with 3 vertical lift bridges
 - Replacement of north and south approach trestles



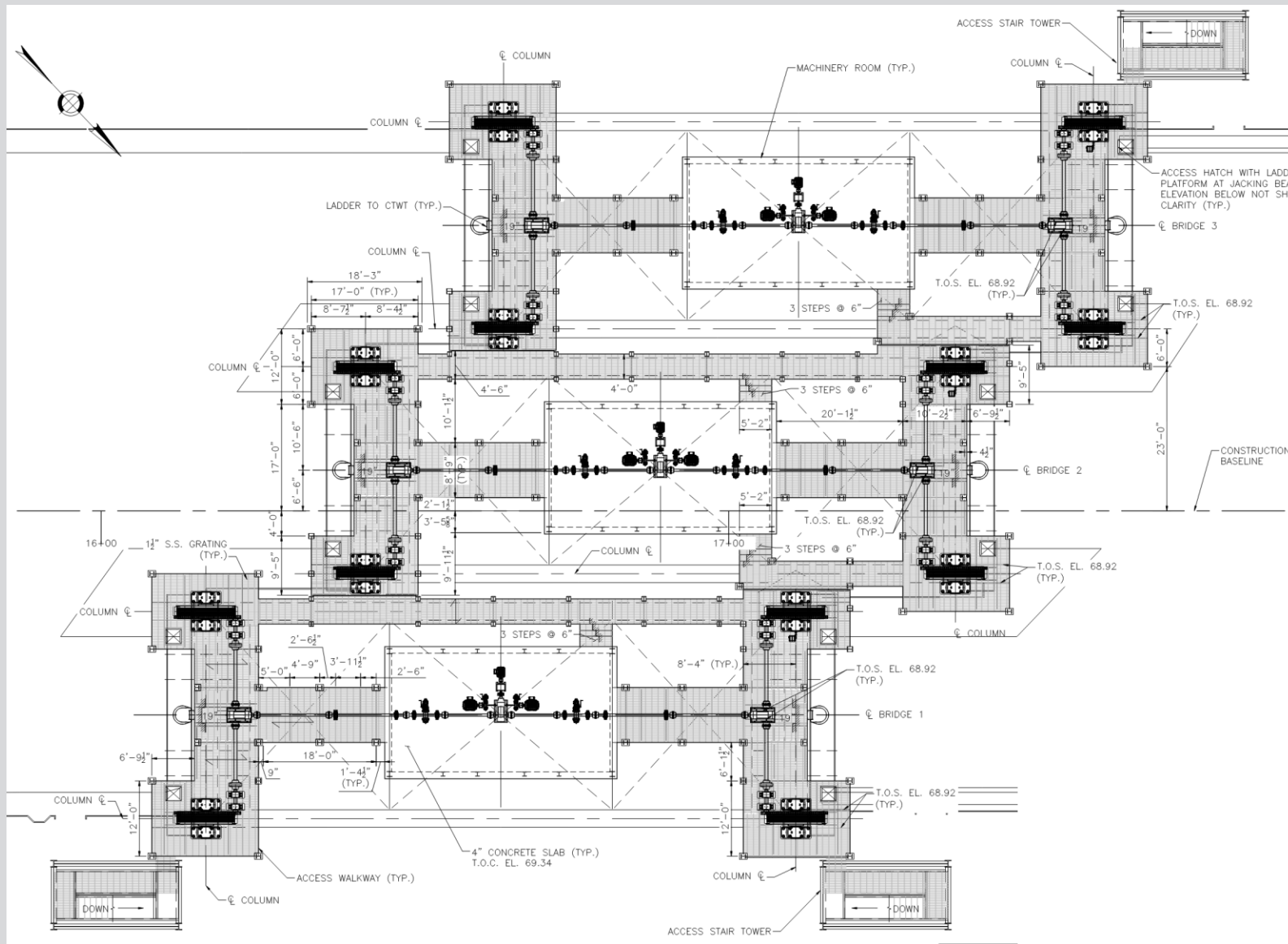
Program Scope – Existing Bridge Plan View



Program Scope – Proposed Bridge Plan View



Program Scope – Mechanical Layout



Program Scope – Bridge Replacement



NORTH STATION
DRAWONE
Bridge Replacement



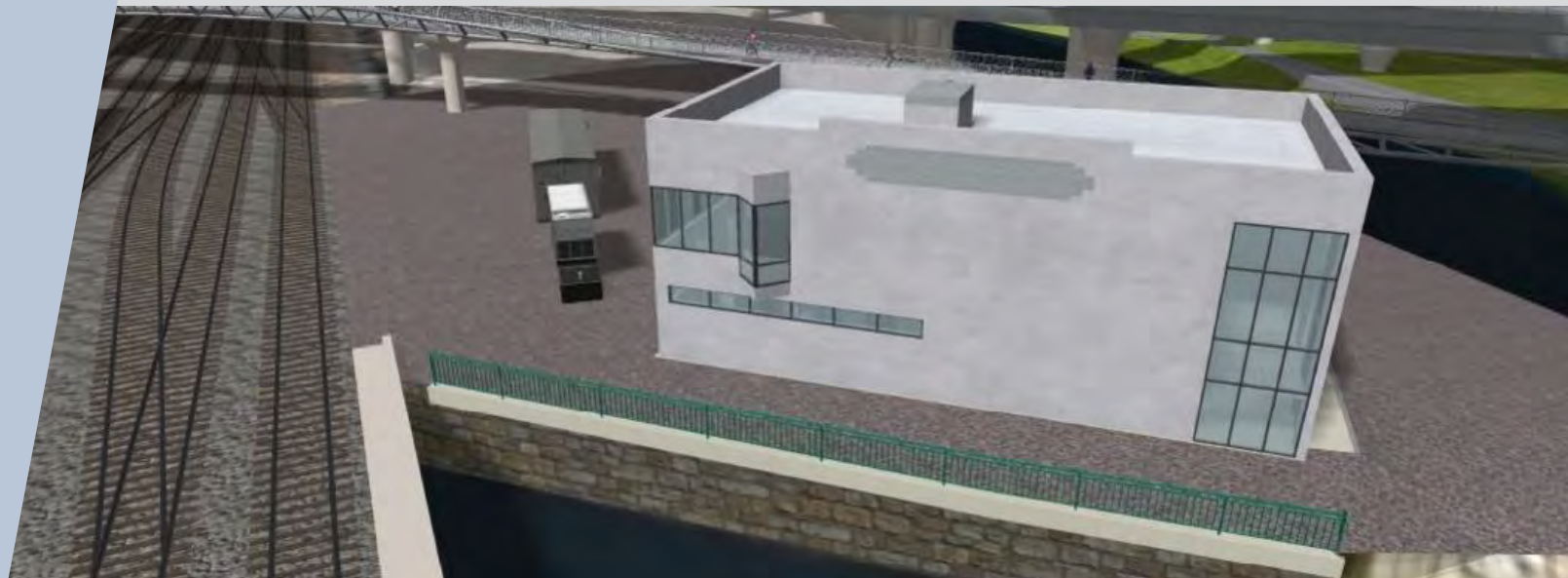
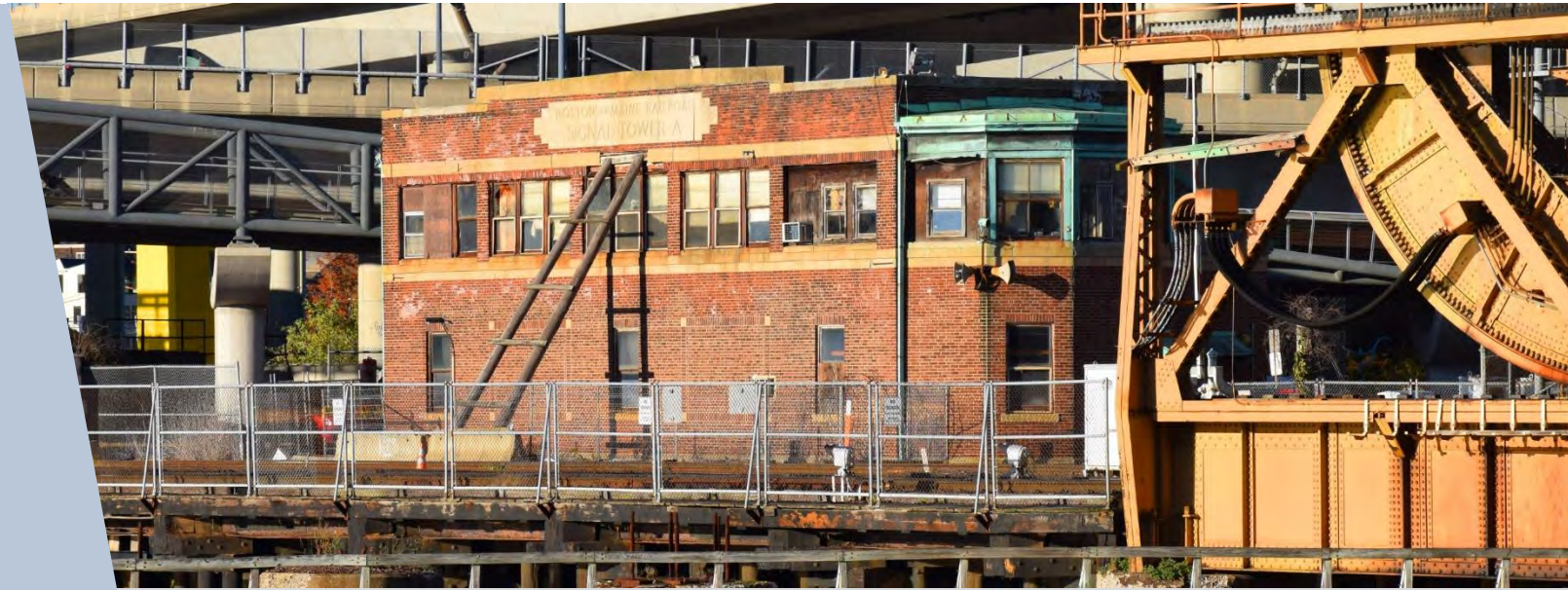
Program Scope – Bridge Replacement



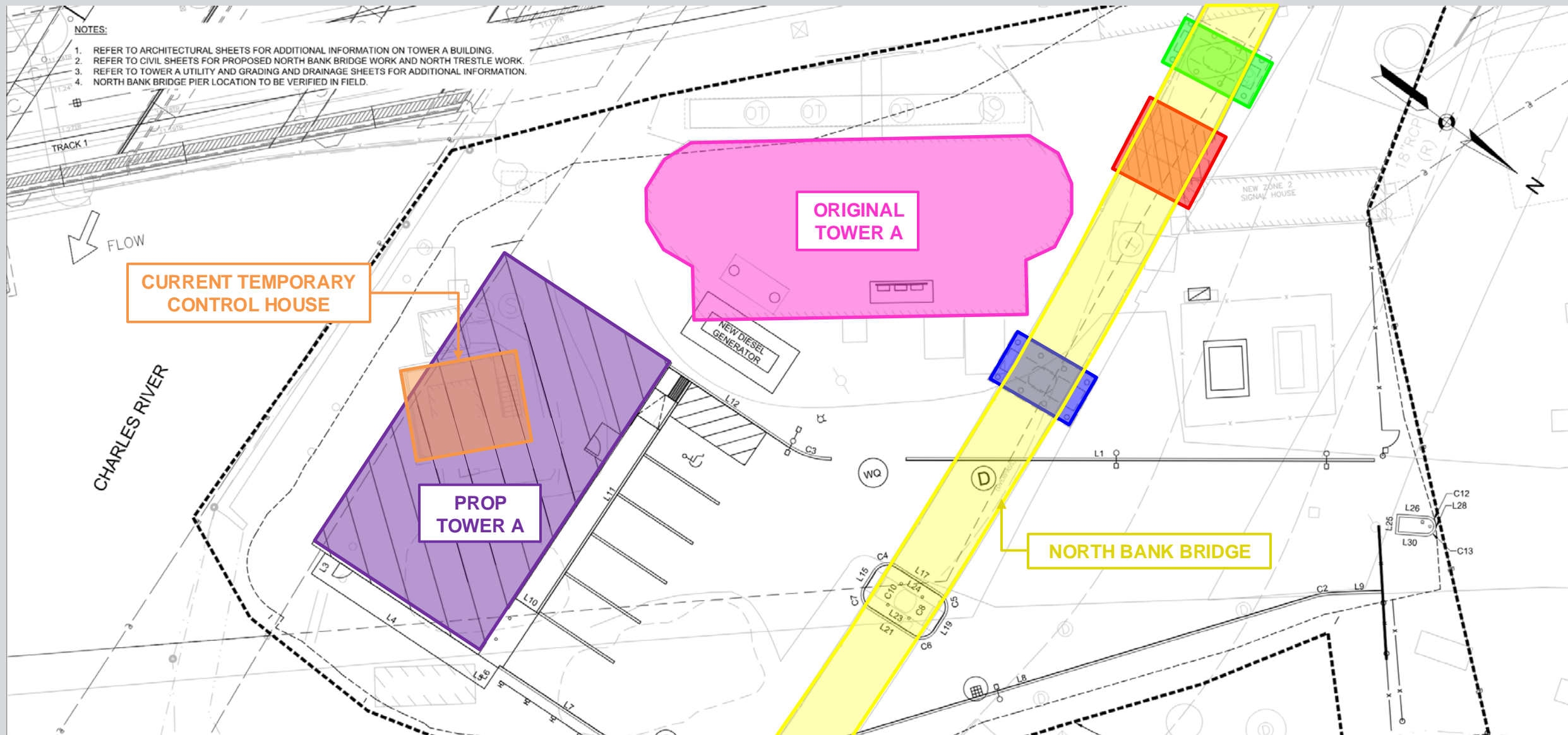
Coast Guard Concurrence

Program Scope – Tower A

- Demolition and reconstruction of Tower A



Program Scope – Tower A

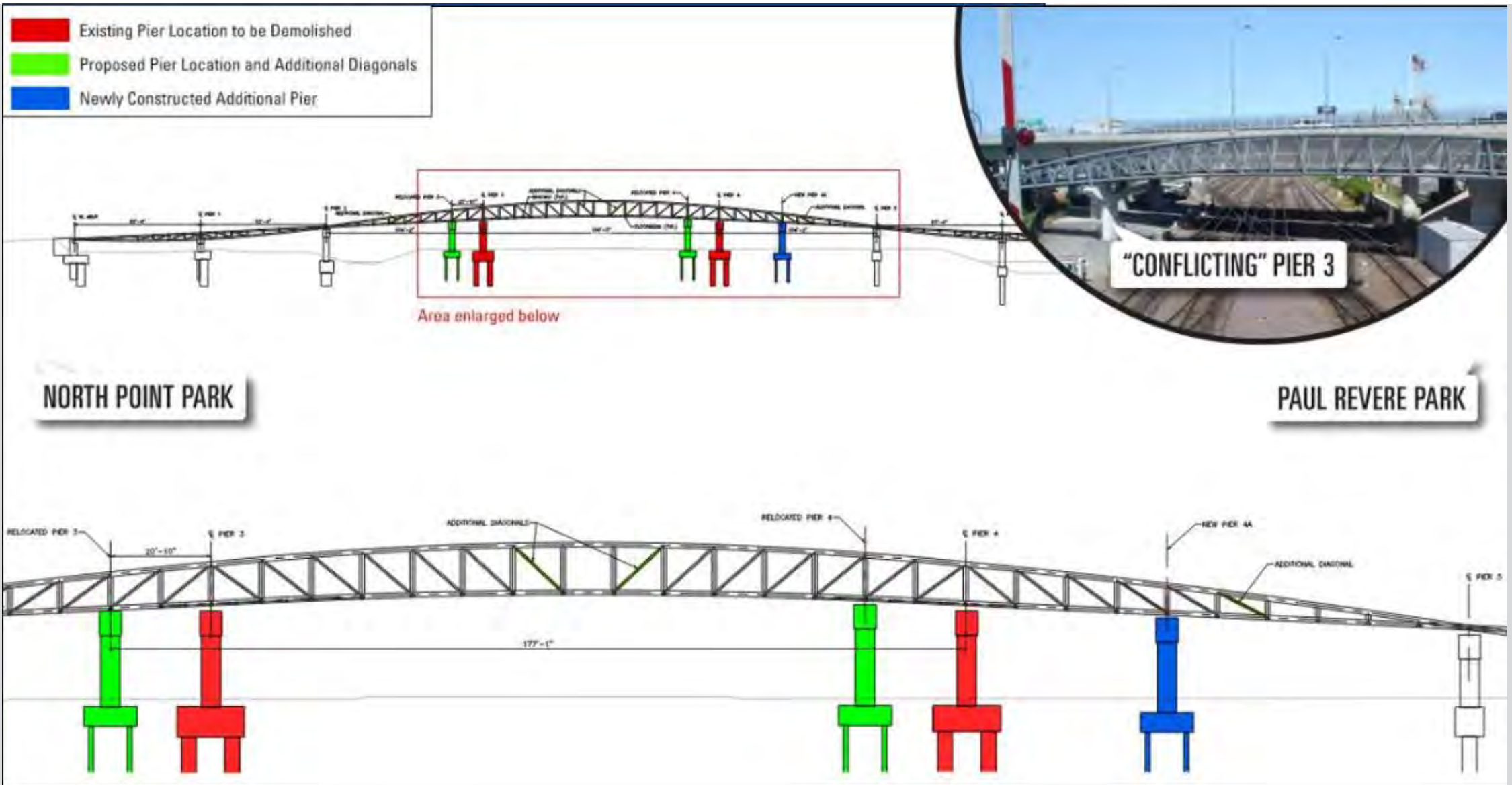


Program Scope – North Bank Bridge

- Adjustments to North Bank Bridge
 - *Raise profile*
 - *Relocate and add piers*
 - *Adjust landings*

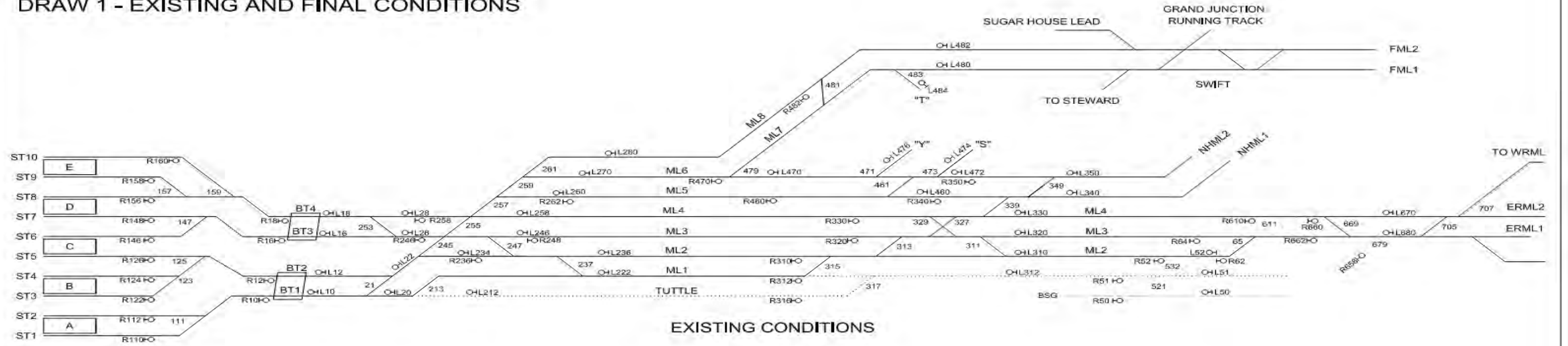


Program Scope – North Bank Bridge

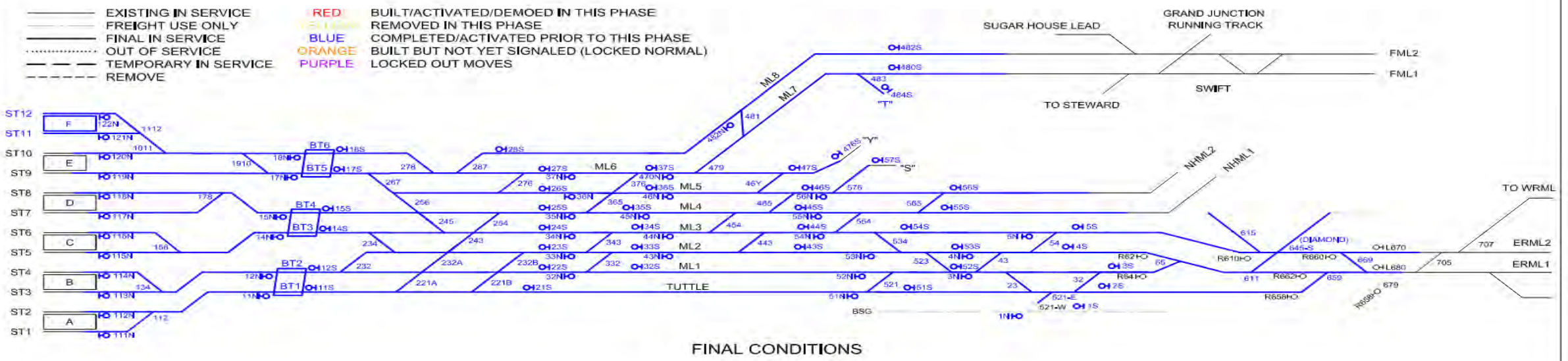


Program Scope – Track

DRAW 1 - EXISTING AND FINAL CONDITIONS



- EXISTING IN SERVICE
 - FREIGHT USE ONLY
 - FINAL IN SERVICE
 - OUT OF SERVICE
 - - - - - TEMPORARY IN SERVICE
 - REMOVE
- RED** BUILT/ACTIVATED/DEMOED IN THIS PHASE
 - YELLOW** REMOVED IN THIS PHASE
 - BLUE** COMPLETED/ACTIVATED PRIOR TO THIS PHASE
 - ORANGE** BUILT BUT NOT YET SIGNALLED (LOCKED NORMAL)
 - PURPLE** LOCKED OUT MOVES



Program Scope – Signal

ZONE 1
(1 SIH)

ZONE 2
(1 SIH)

ZONE 3
(1 SIH)

ZONE 4
(1 SIH)

ZONE 3A/5
(1 SIH)

SAND INT.
(1 SIH)



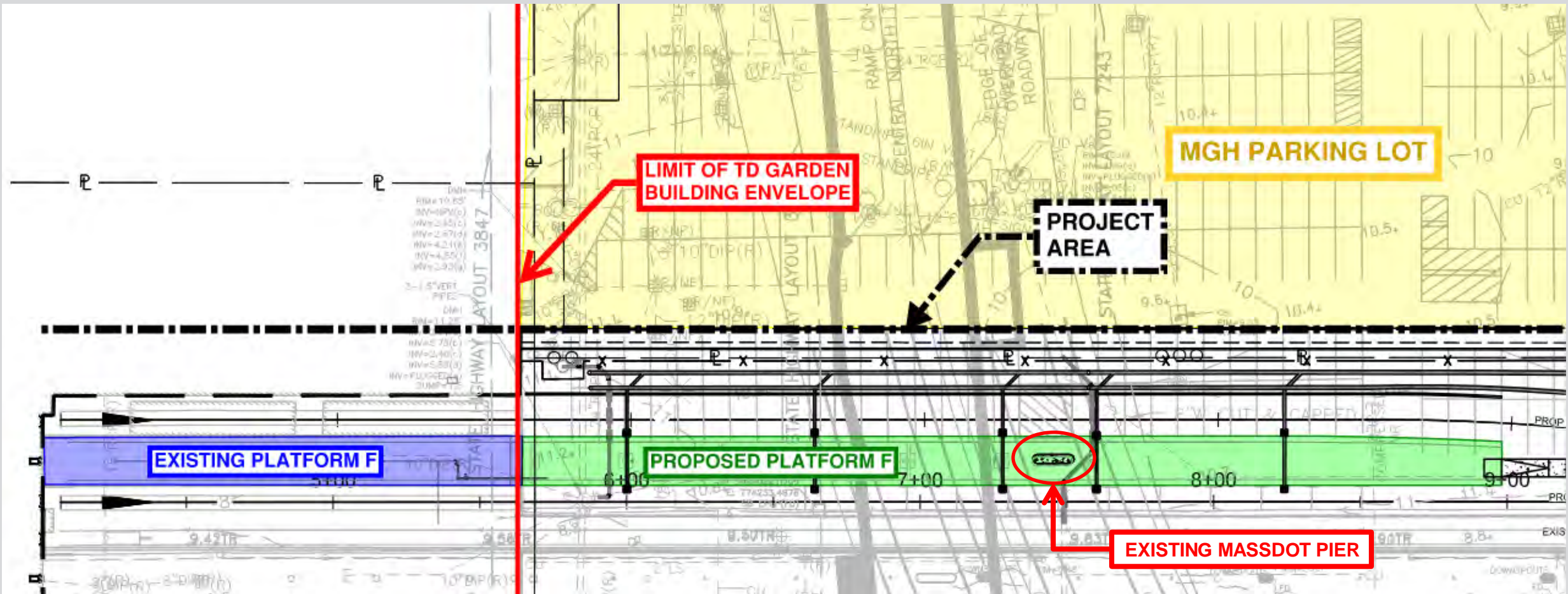
SIGNAL INSTRUMENT HOUSES

Program Scope – North Station

- North Station
 - *Addition of Tracks 11 and 12 at North Station*
 - *Extension of existing Platform F*



Program Scope – North Station



Extension length: 338 ft

North Station Draw One Bridge Replacement Program

Challenges

Challenges

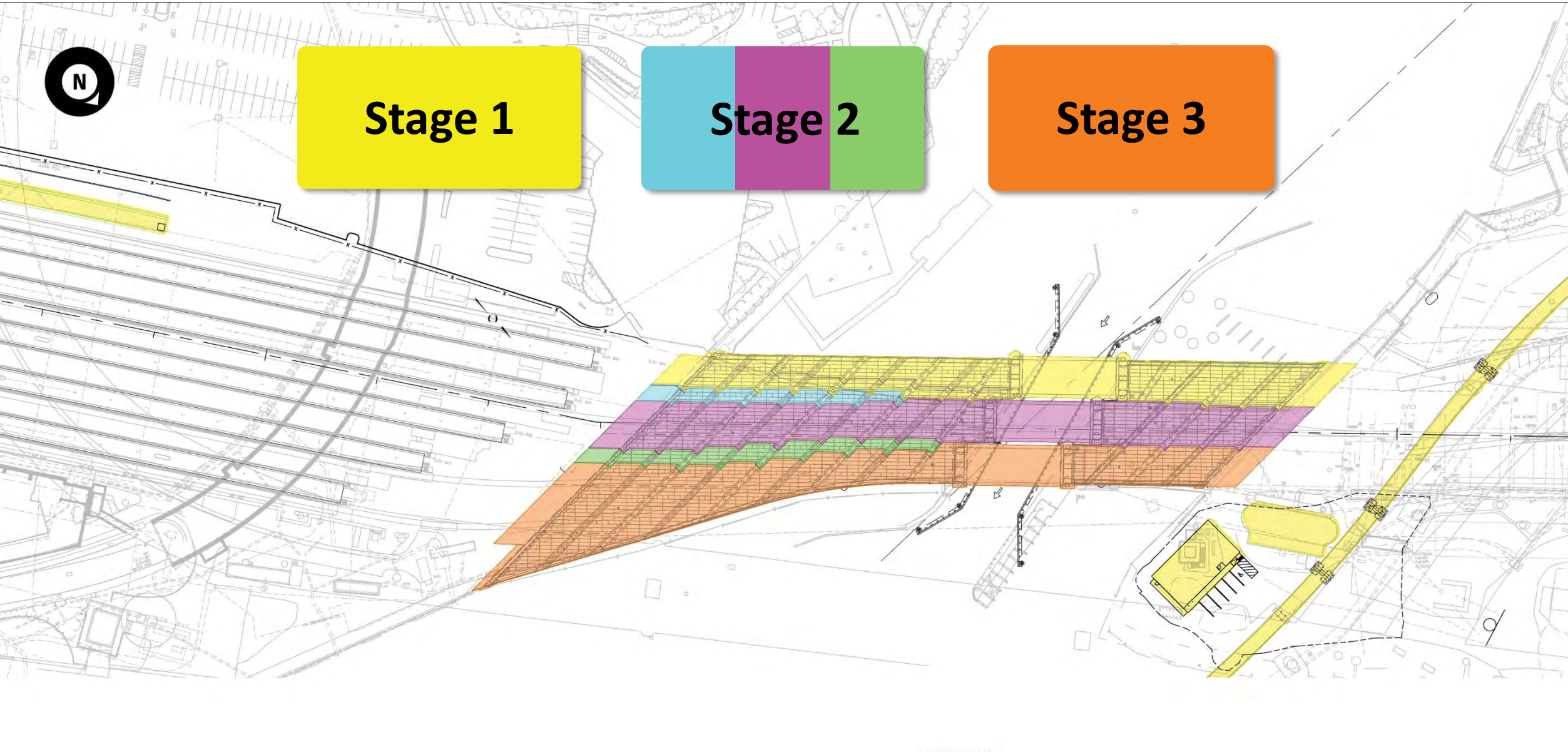
- Maintain Operations
 - *A minimum four active tracks over river*
 - *A minimum eight active tracks at North Station*
 - *Minimize navigation channel closures*
- Construction Staging
 - *Working adjacent to and between active tracks*
 - *Construction of bridge between active bridges*
- Temporary Work Areas
- Abutting Properties



Challenges – Operations



Challenges – Construction Stages



Challenges – Construction Stages

3 new movable bridges to be installed in 3 sequential stages

North Station to be kept open throughout construction, with 4 active tracks maintained across the river

Stage 1

2.5 years

- Build first new movable bridge upstream of existing bridges
- Build approach trestle structures for the first bridge
- Existing bridge not impacted

Stage 2

2.5 years

- Demolish upstream existing movable bridge
- Build second new movable bridge in the same location as existing bridge
- Demolish and replace approach trestle structures for second movable bridge

Stage 3

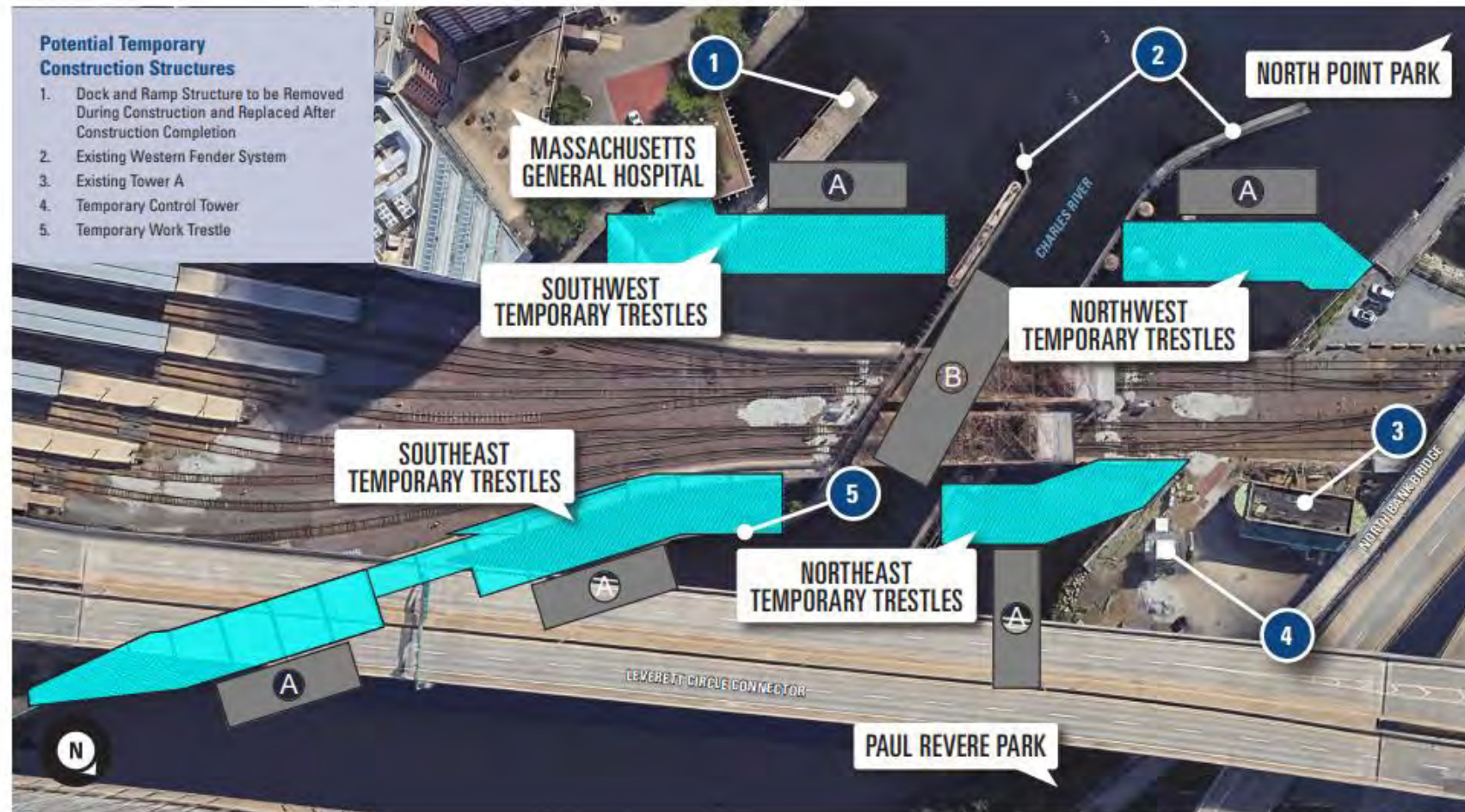
2.0 years

- Demolish downstream existing movable bridge
- Build third new movable bridge in the same locations as existing bridge
- Demolish and replace approach trestle for third movable bridge

Challenges – Track and Signal Stages

Bridge Stage	Stage 1	Stage 2	Stage 3
Number of Track and Signal Phases and Subphases	14	32	11
Units of Special Trackwork Installed	24	36	16
Number of Signal Zones Impacted	7*	7*	7*
*Quantity includes impacts to adjacent Tower A interlockings (FX and Sand)			

Challenges – Temporary Work Areas



- A** Barge for Material Delivery and Storage
- B** Barge for Float-out of Existing Spans (Temporary Channel Closure)

Note: Contractor may elect to use temporary trestles and barges during construction. Change to something like: Barges and temporary trestles shown on structures would be underneath the structure except location 1. All of the barges and temporary trestles shown are underneath the elevated overhead structures.

Challenges – Contractor Operations

PRELIMINARY

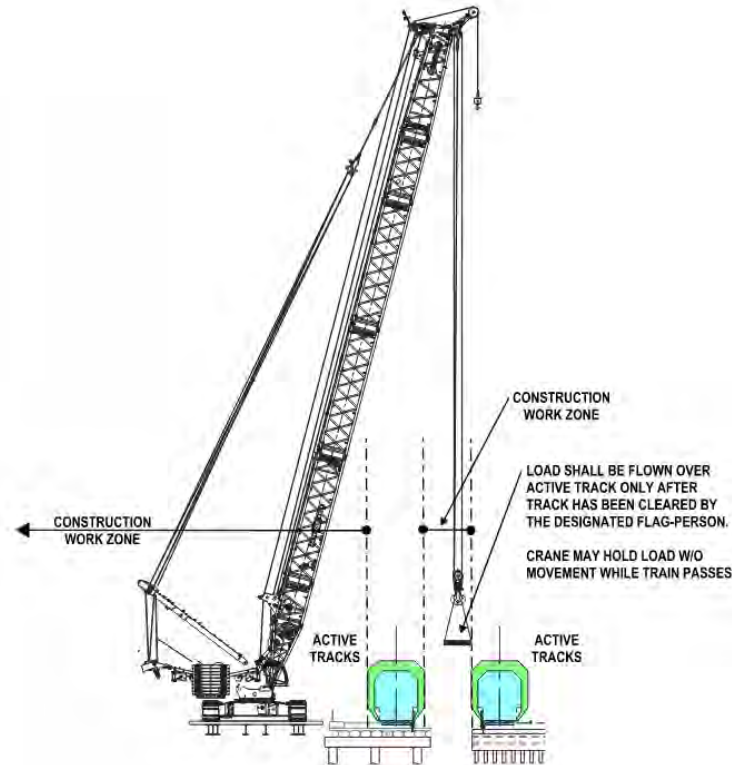
Working On Temporary Trestle - Swing Over Tracks

Activity

- * Loading/Unloading Delivery Trucks/Barges to stack materials in designated Construction Zones on the Existing/New Approach Trestles
- * Swinging materials stored on Temporary Trestle into designated Construction Zones on the Existing/New Approach Trestles

Limitations


- * Crane Operator shall report all crane activities to designated MBTA/Keolis flag-person
- * Crane shall only be allowed to swing towards an active track when "cleared" by designated MBTA/Keolis flag-person however crane load does not foul the established clearance envelope for nearest active track.
 - ** Note that "cleared" may include an active track(s) that remains active but a train has passed by the influence of the crane swing
 - ** Note that "cleared" may include an active track(s) that has been temporarily made inactive for a designated period of time
- * Contractor shall demonstrate that both the rear gantry and CTWT will not overlap with established track clearance envelope when swinging away from adjacent tracks.
- * Crane operator shall be allowed to swing, boom in/out and load/unload the hook after track(s) has been "cleared"
 - ** Note that "cleared" tracks include the track under the crane boom and the track adjacent to the established Construction Zone
- * Crane operator shall be allowed to hold suspended pick with no movement of the crane (swinging or booming in/out) while a train passes under provided it has been proven that the crane boom is clear of the established clearance envelope
- * Crane operator shall swing and boom in/out following the direction of a designated iron-worker spotting the crane operations. The iron-worker spotting the crane operations shall be known as the "Phone-Man" or "Tagger" and shall be responsible for ensuring the limits of the established track clearance envelope are maintained.



VIEW - LOOKING SOUTH TO NORTH

Crane Operator shall report all crane activities to designated MBTA/Keolis flag-person
Crane shall only be allowed to swing over an active track when cleared by designated MBTA/Keolis flag-person

CRANE ACTIVITIES OVER ACTIVE TRACKS NORTH STATION DRAW 1 BRIDGE REPLACEMENT

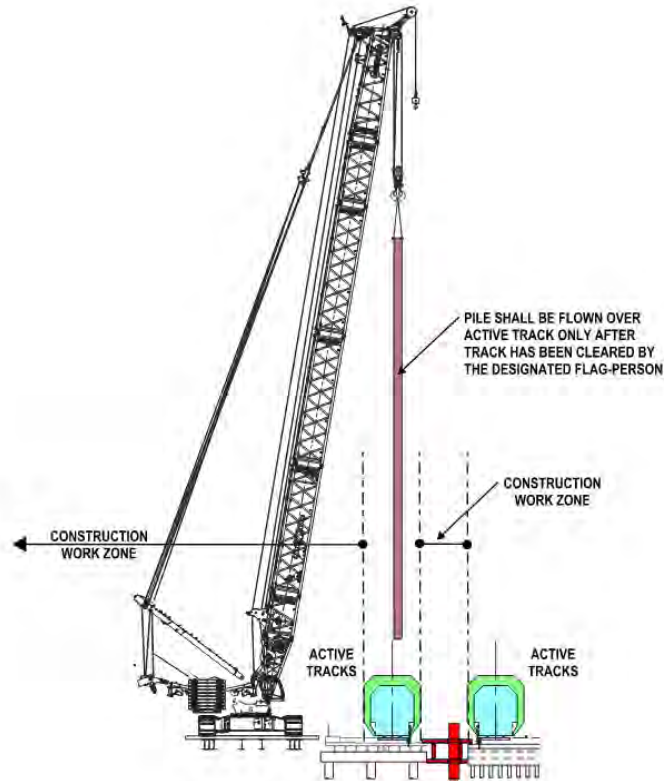
 Massachusetts Bay Transportation Authority				Approved By:
				DATE 02-28-22
PROJECT			BY	SHEET NO. Draw1Safety - 4
NO.	DATE	REMARKS	BY	

PRELIMINARY

Challenges – Contractor Operations

PRELIMINARY

Working On Temporary Trestle - Pile Installation



VIEW - LOOKING SOUTH TO NORTH

Activity

- * Loading/Unloading Delivery Trucks/Barges to stack piles in designated Construction Zones on the Existing/New Approach Trestles
- * Swinging piles stored on Temporary Trestle into designated Construction Zones on the Existing/New Approach Trestles
- * Swinging piles into position and setting piles in an engineered template to provide alignment and stability.

Limitations

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- * Piles may be inserted into approved engineered template and released from the crane hook provided the pile is secured from tipping.

Crane Operator shall report all crane activities to designated MBTA/Keolis flag-person
 Crane shall only be allowed to swing over an active track when cleared by designated MBTA/Keolis flag-person

CRANE ACTIVITIES OVER ACTIVE TRACKS

NORTH STATION DRAW 1 BRIDGE REPLACEMENT

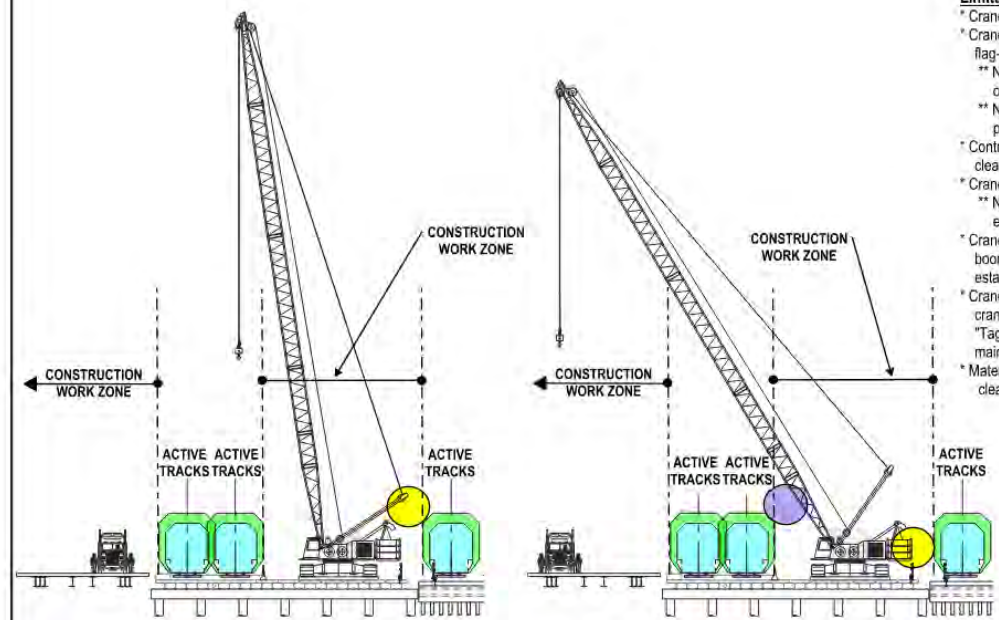
				 Massachusetts Bay Transportation Authority		Approved By:	
						DATE: 02-28-22	
						SHEET NO.: Draw1Safety - 5	
NO.	DATE	REMARKS	BY	PROJECT			

PRELIMINARY

Challenges – Contractor Operations

PRELIMINARY

Crane Operator shall report all crane activities to designated MBTA/Keolis flag-person
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VIEW - LOOKING SOUTH TO NORTH

- CRANE GANTRY AND CTWT SWING CLEAR THE ESTABLISHED CLEARANCE ENVELOPE FOR THE ADJACENT TRACK

VIEW - LOOKING SOUTH TO NORTH

- CRANE CTWT SWING CLEARS THE ESTABLISHED CLEARANCE ENVELOPE FOR THE ADJACENT TRACK
- CRANE BOOM CLEARS THE ESTABLISHED CLEARANCE ENVELOPE FOR THE ADJACENT TRACK


Working On New/Existing Approach Structure - Between Active Tracks

Activity

- * Moving material from temporary trestle to active construction work zone between active tracks
- * Erecting New Structures and Track outside of active tracks
 - ** Demolition picks of existing trestle
 - ** Pile Installation & Pile Driving
 - ** Erection of new PBU's (Precast Bridge Units)
 - ** Installation of new track panels

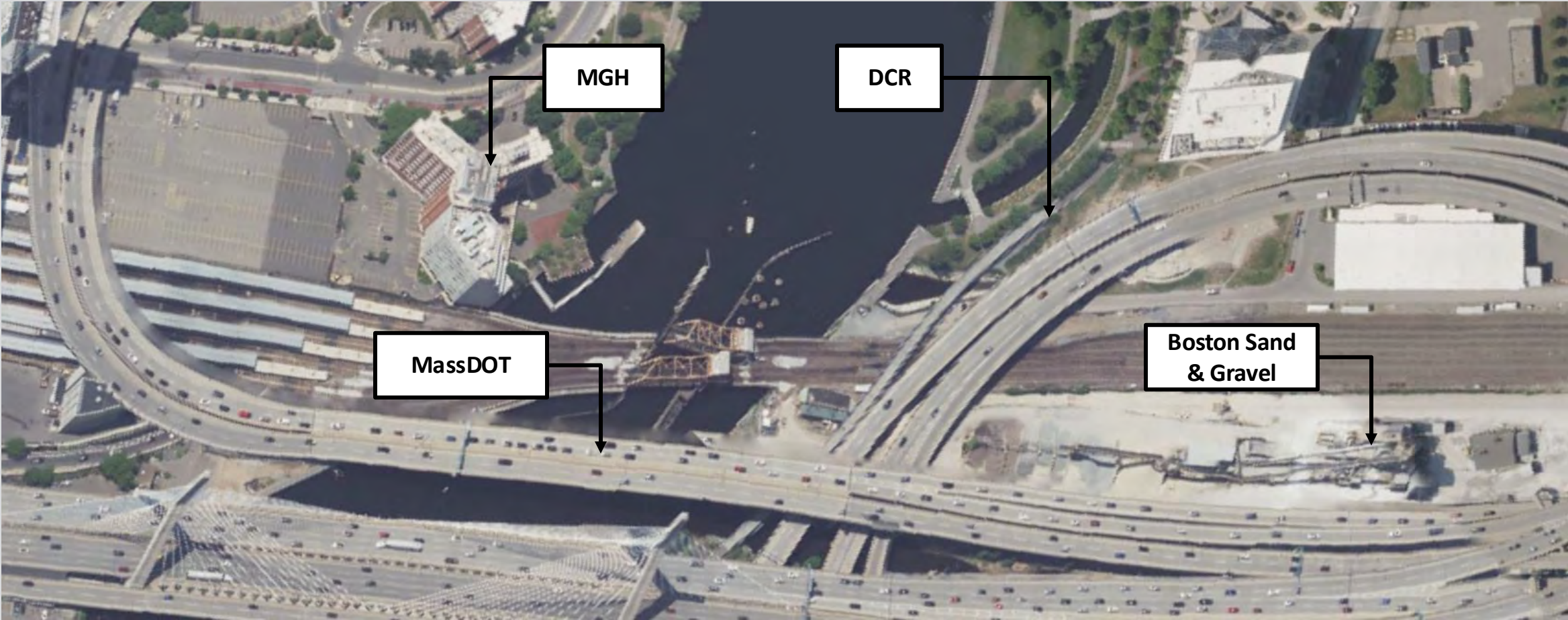
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- * Material shall be allowed to be stacked in stable units provided the material is outside the established clearance envelope.

CRANE ACTIVITIES BETWEEN ACTIVE TRACKS			
NORTH STATION DRAW 1 BRIDGE REPLACEMENT			
		Massachusetts Bay Transportation Authority	Approved By: DATE: 02-28-22
PROJECT	BY	SHEET NO.	Draw1 Safety - 9
NO.	DATE	REMARKS	BY

PRELIMINARY

Challenges – Abutting Properties



Program Scope – Virtual Tour Website



North Station Draw One Bridge Replacement Program

Funding

Funding

- Fully funded
 - \$1.2B authorized in the MBTA CIP
 - \$472 million MPDG MEGA Grant
 - Notice of award September 2024



North Station Draw One Bridge Replacement Program

NEPA Review

Environmental Process

- Federal and State Coordination
- NEPA Environmental Assessment
- Section 106 Consultation
- Tribal Consultation
- Section 4(f) of the USDOT Act
- National Flood Insurance Program & Executive Order 11988 Compliance



ROSALES + PARTNERS
ARCHITECTS ENGINEERS
37 Newbury Street, 6th Floor Boston, MA 02116

- Spring 2024 Stakeholder Engagement
- June 6th Public Meeting
- Planned NEPA EA Public Meeting early 2025

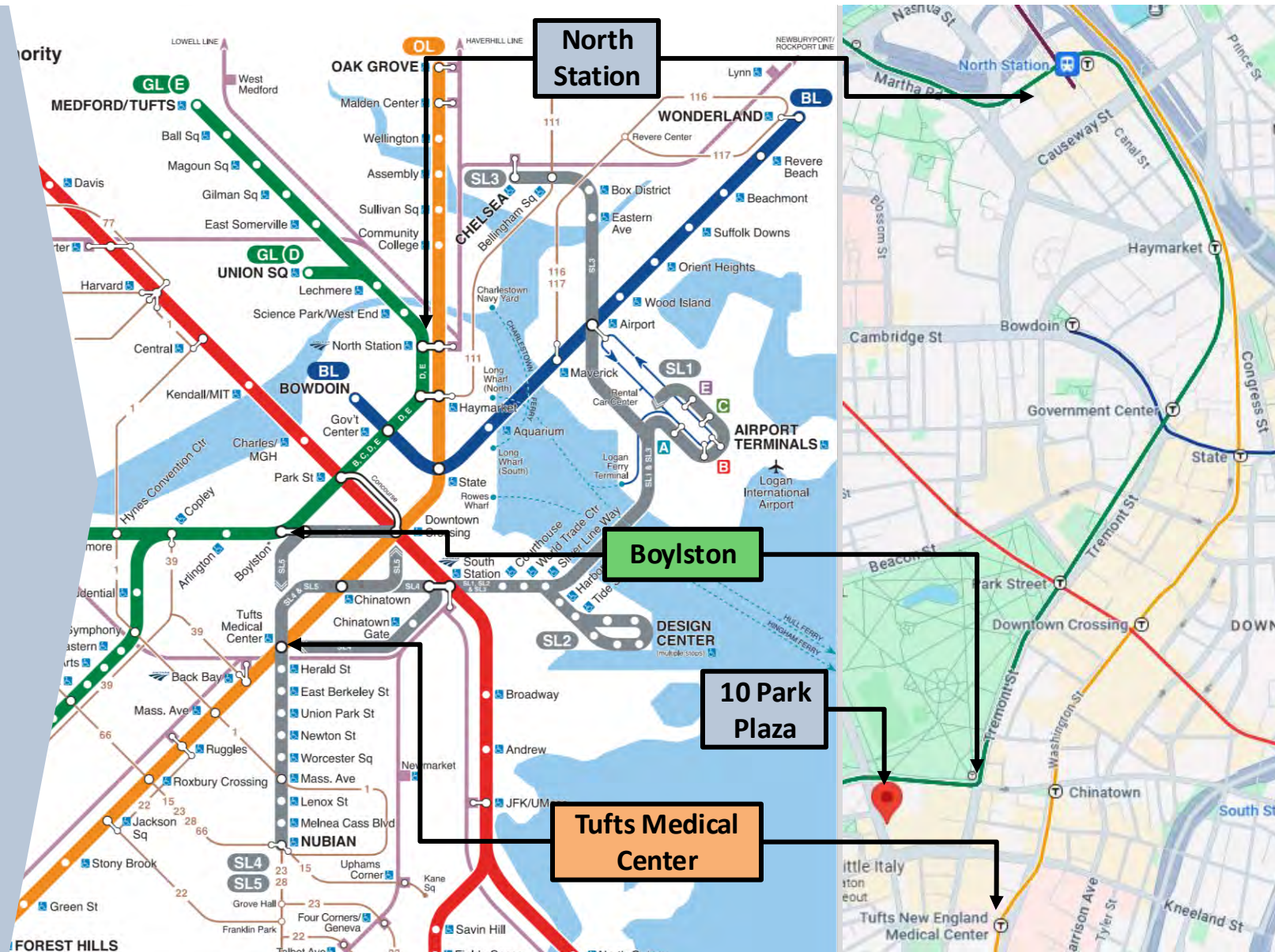
FONSI anticipated March 2025

North Station Draw One Bridge Replacement Program

Afternoon Site Tour

Tour Details – Getting to North Station

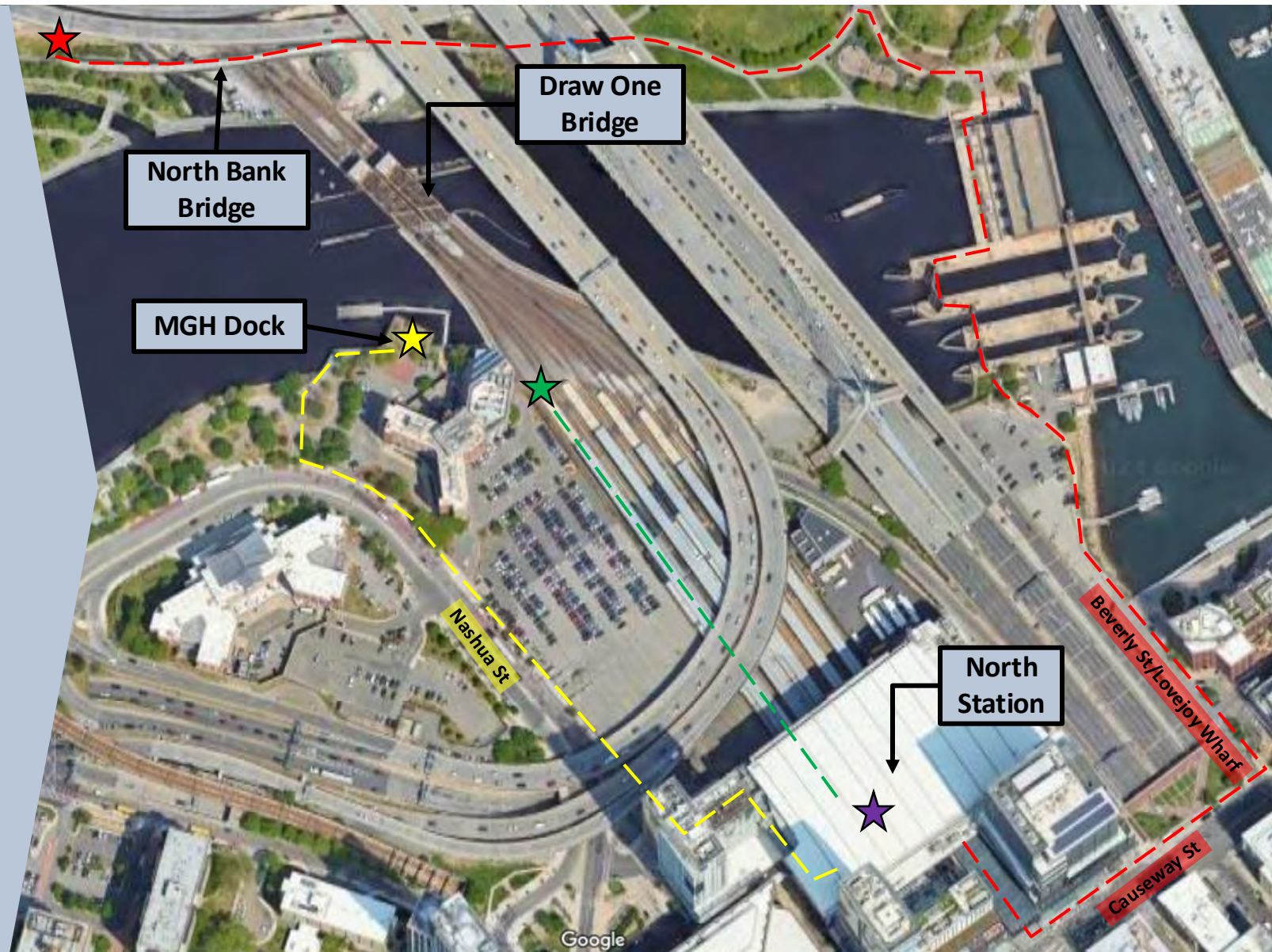
- Orange Line from Tufts Medical Center to North Station
- Green Line from Boylston to North Station



Tour Details – Speaker Locations

Speaker Locations

- Purple Star: Check-in Table/Access for Platform Speakers
- Green Star: Platform E
 - *Green dashed line: platform for Tracks 9 and 10*
- Yellow Star: MGH Dock
 - *Yellow dashed line: walking path from North Station to MGH Dock*
- Red Star: North Bank Bridge
 - *Red dashed line: walking path from North Station to North Bank Bridge*





Massachusetts Bay
Transportation Authority

Questions and Answers



Thank You