Pier 5

Engineering Report & Visioning Session

boston planning & development agency

January 4, 2024

MEETING RECORDING

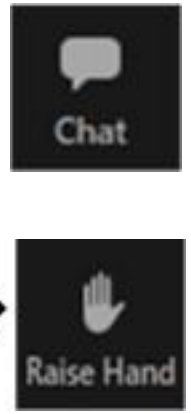
At the request of community members, this event will be recorded and posted online for those who are unable to attend the Zoom event live.

Also, it is possible that participants may be recording the meeting with their phone cameras or other devices. If you do not wish to be recorded during the meeting, please turn off your microphone and camera.

If your camera and microphone are off, you can still participate through the text chat feature.

ZOOM TIPS

Your controls are at the bottom of the screen:



Use the chat to type a comment or ask a question at any time – BPDA staff will moderate the chat

To raise your hand, click on “Participants” at the bottom of your screen, and then choose the “Raise Hand” option in the participant box

Mute/unmute – Participants will be muted during the presentation – the host will unmute you during discussion if you raise your hand and it is your turn to talk

Turns your video on/off

boston planning & development agency

ZOOM ETIQUETTE

We want to ensure that this conversation is a pleasant experience for all attendees.

- We strongly encourage speakers to turn on their cameras while speaking.
- Comments or questions from the public will be limited to 2 minutes of speaking time. Two questions per person at a time is the maximum. A 30-second follow-up comment after a staff member responds is allowed. These time limits will be strictly enforced.
- All attendees are expected to respect one another and any differences of opinion. We welcome differences of opinions, including opinions that differ from those of BPDA staff. Always assume good intentions when any contradictions or disagreements are made. Constructive comments and opinions should be aimed at topics, not people.

Unacceptable behavior will not be tolerated. Examples of unacceptable behavior are instances such as the following, but not limited to:

- Threatening to take unwarranted legal action against meeting participants
- Bullying participants either in the chat or verbally out loud
- Harassment including criticizing, mocking, or posing threats against participants
- Threats or derogatory speech against BPDA staff or other participants
- Grandstanding or exceeding allowed time limits
- Other violations within this code of conduct

Those who violate the code of conduct may be subject to the following actions:

- Given a verbal or written warning
- Muted for the entirety of the meeting or event
- Removed from the meeting or event. If we are unable to get to your question at this meeting please put them in the Chat at the end or email natalie.deduck@boston.gov

boston planning & development agency

Goal for Discussion:

- To update the Charlestown community about the results of the Engineering Study conducted by Foth Engineering.
- Discuss potential redevelopment considerations for Pier 5.

Agenda

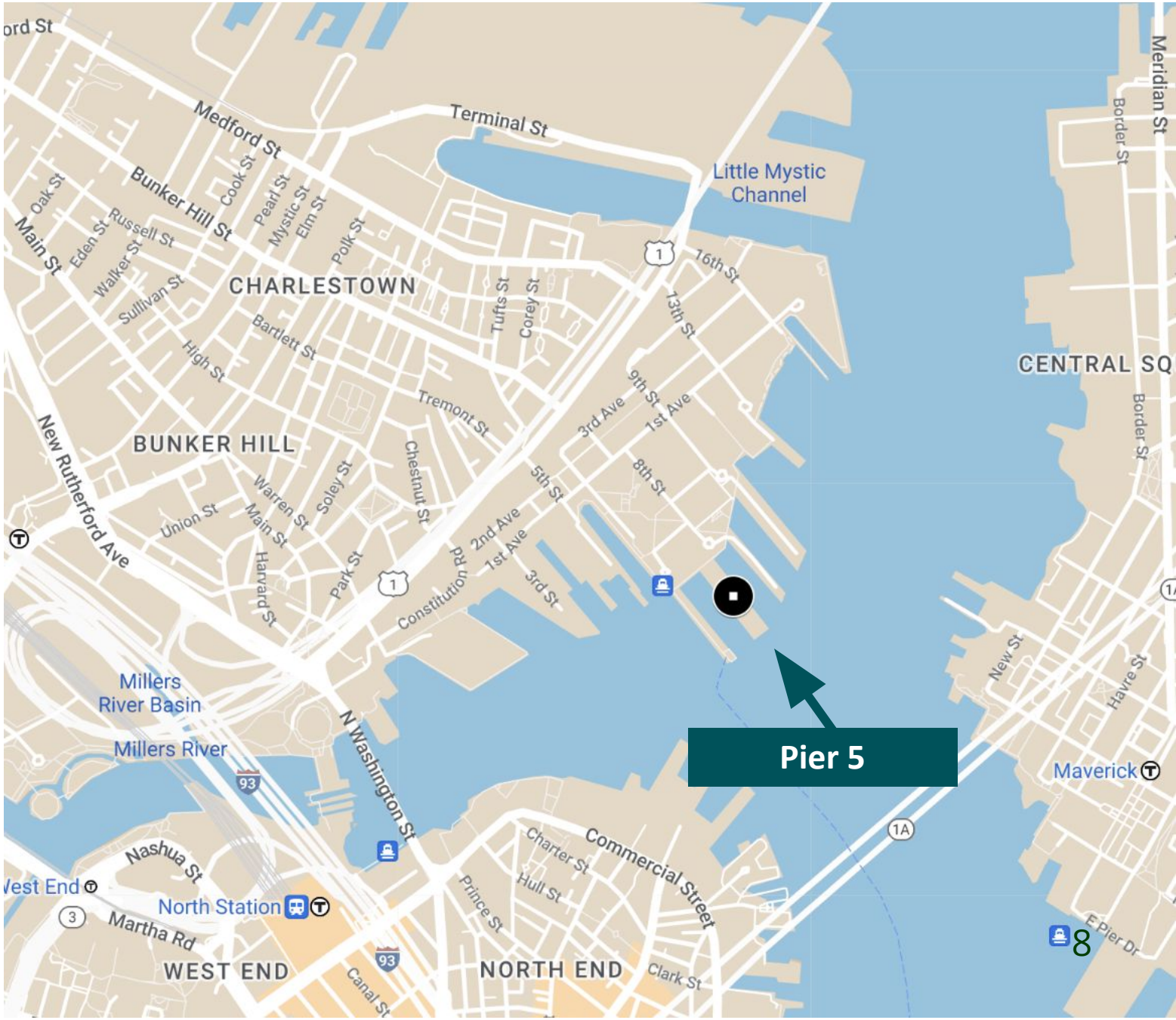
1. Project Location & Planning Overview
2. Details of the RFP for the Engineering Study
3. Presentation by Foth
4. Visioning Session for Redevelopment Strategy
5. Next Steps

Project Location & Overview

boston planning &
development agency

Location

- Pier 5 is located within the Charlestown Navy Yard
- Originally a Navy pier, it was built of wood in 1912 and reconstructed with concrete in 1943.

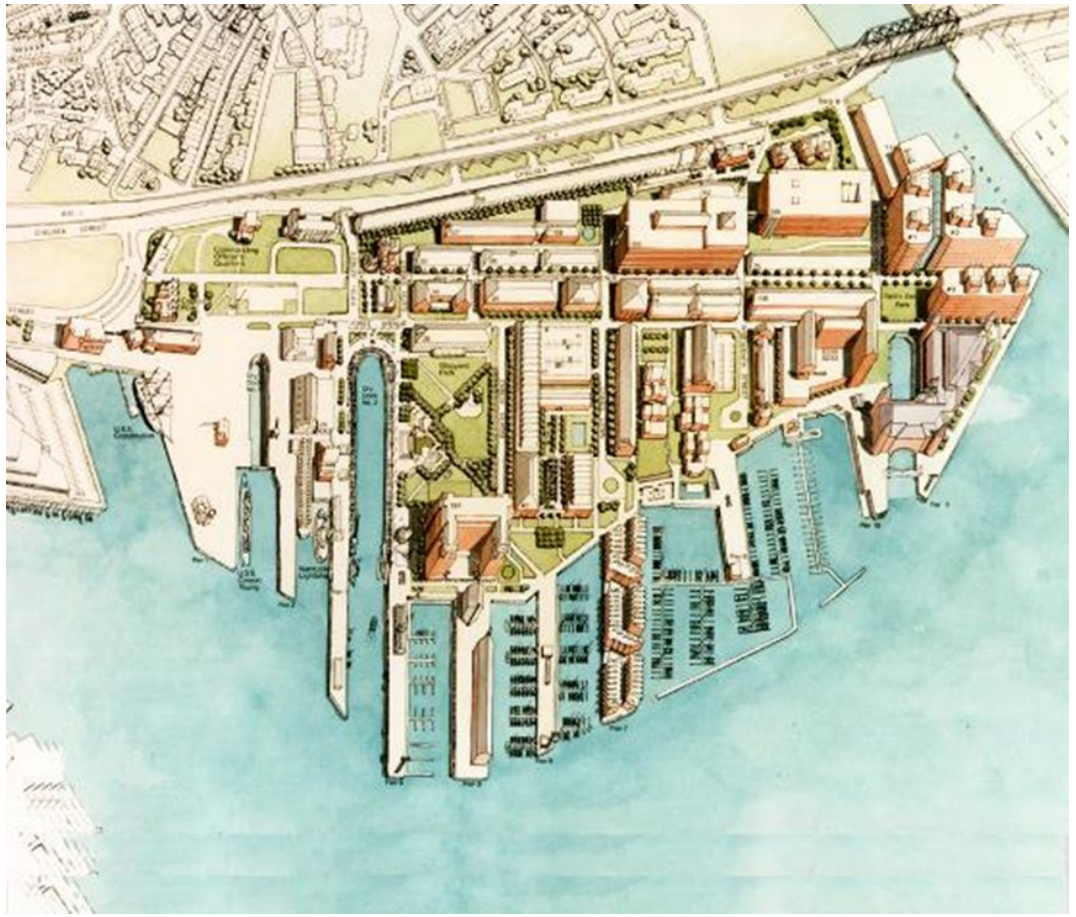


boston planning & development agency

Disposition History

- In 2007, a development was proposed that would include 89 units and a ground floor with a B&B, café, and exterior space programmed as Interactive Maritime Park.

- In September 2020, the BPDA released an RFP to redevelop the Property to allow open space, residential, and/or hotel uses. The BPDA decided to reject all the proposals based on community feedback.



1978 CNY Master Plan

Overview of Planning and Design Guidelines

- **Zoning District:** Harborpark Article 42F: Charlestown Waterfront
- **Chapter 91 Jurisdiction** and promotion and protection of water-dependent uses and public facilities. (*marinas, recreational uses, boating facilities, water-based recreational uses, etc.)*
- **Charlestown Navy Yard Master Plan (1978) and Municipal Harbor Plan (1991, 2008):** Adaptive reuse/redevelopment of Pier 5 has been anticipated/contemplated.
- **2007 Waterfront Activation Plan:** Civic /cultural and public facilities, outdoor exhibit/interpretive areas along Harborwalk

Overview of Planning and Design Guidelines

Climate Ready Boston (2016) and **Imagine Boston 2030** (2018)

- Create signature new open spaces that leverage underutilized waterfront sites
- Create flood protection systems that provide multiple benefits
- Form networks of connected open spaces and cultural destinations
- Grow the diversity of experiences along stretches of the waterfront
- Expand connections between neighborhoods and the waterfront
- Strengthen and expand waterfront housing and job centers
- Apply new, sustainable models for the creation and maintenance of public waterfront areas

PLAN Charlestown: Focused on improved connectivity, adaptive reuse and preservation, waterfront activation with improved signage, and economic development.

Coastal Resilience Solutions for East Boston and Charlestown Phase II: Raised Harborwalk in Navy Yard

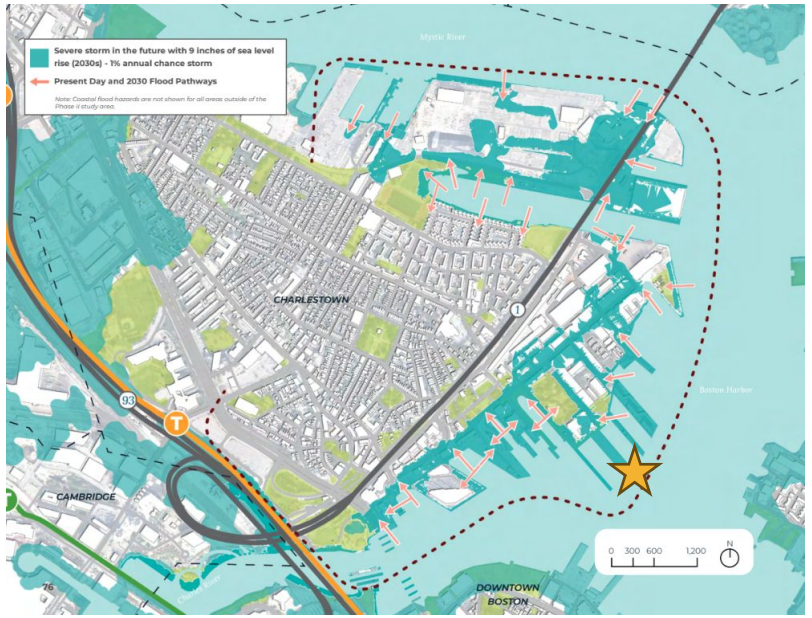
Coastal Resilience

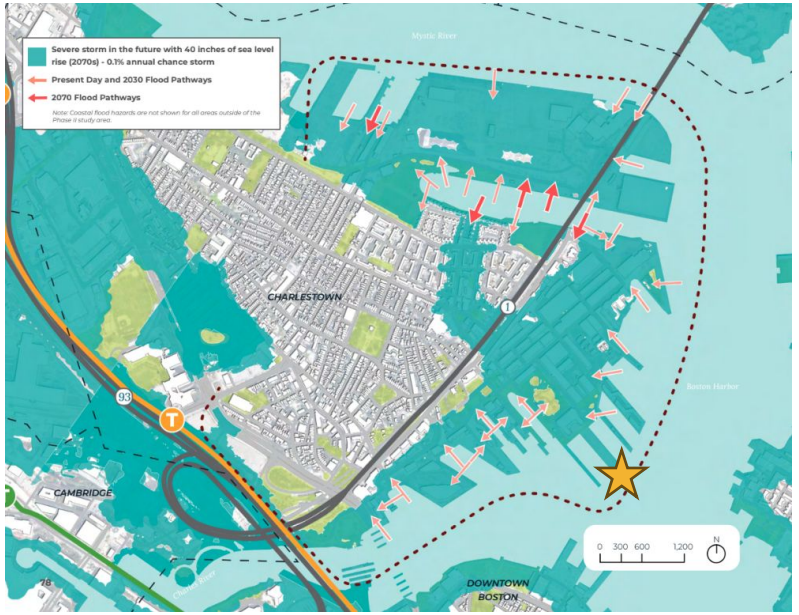
Climate Change scenarios that must be taken into account:

The City of Boston and the BPDA have studied what future flooding will look like in the City using the most up to date data from the Massachusetts Coastal Flood Risk Model (MC-FRM).

- 9 inches of Sea Level Rise (2030s)
- 40 inches of Sea Level Rise (2070s)

A vulnerability assessment of areas in the Charlestown Navy Yard will be conducted in 2024 by the BPDA and anything that is developed for Pier 5 must be coordinated with a future solution to be a part of the district scale flood solutions.





(TOP) 2030 Projections: 9 inches of SLR + 1% Annual Chance Storm
(BOTTOM) 2070 Projections: 40 inches of SLR + 1% Annual Chance Storm

Details of RFP for Engineering Study

boston planning & development agency

Pier 5 Engineering Study: RFP Timeline

Date	Process
November 2022	Published the RFP for an Engineering Study for Pier 5.
December 13, 2022	Held virtual pre-submission meeting.
December 15, 2023	Held in-person pre-submission meeting at Pier 5
January 4, 2023	Published an addendum to include responses to questions received from prospective responders and the community.
January 18, 2023	Received three proposals from: DeSimone, Foth, GEI

Pier 5 Engineering Study: RFP Scope of Work

The scope of the RFP included three phases:

Phase 1
(We are here!)
	• Study and assessment of the piers structural condition based on Waterfront Facilities Inspection and Assessment Manual and provide design concept and costs estimate for 3 programs outlined below:
	  • **Program "A"** improves existing pier to accommodate only pedestrian loads of 100 lbs/sf
	  • **Program "B"** to improve existing pier to accommodate improvement as a Public Park and Sailing Center
	  • **Program "C"** for Demolition of existing pier to create open watersheet. This option would create open watersheet for any future potential uses of this location

Phase 2	• Provide design development and construction documents based on one of the schemes outlined above
Phase 3	• Construction phase engineering administration

Pier 5 Engineering Study: RFP Evaluation

All responses were reviewed by the selection committee based on the criteria outlined in the RFP and summarized below:

1. Qualified Staff
2. Relevant Experience
3. Demonstrated Capacity
4. Qualified Sub-Consultants
5. Understanding of Scope of Services

- In addition to the submitted responses, the selection committee interviewed each responders.
- Based on the submittal and interviews, the selection committee selected Foth as most advantageous with their extensive experience in similar projects and understanding of past and current community involvement in the process
- BPDA board approved contract of this work on their scheduled meeting held on March 16, 2023.

Presentation of Engineering Report: Foth

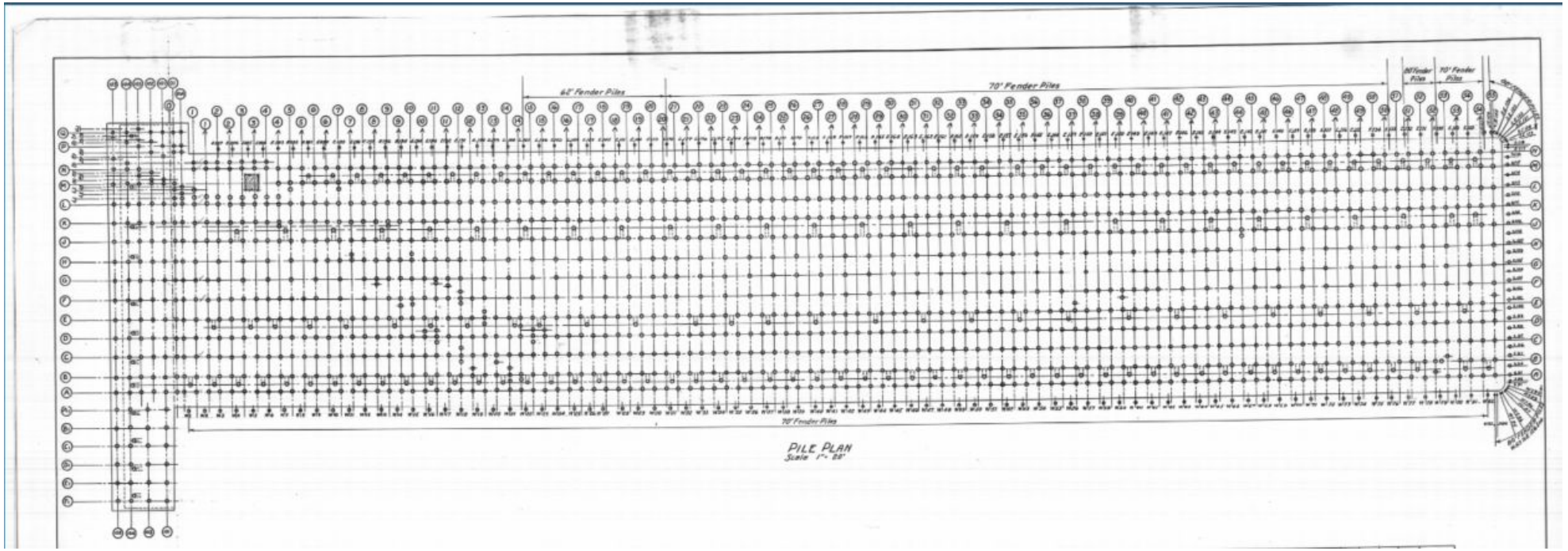
boston planning & development agency

Pier 5 Waterfront Inspection and Assessment

Presentation Overview

- Pier 5 Overview
- Inspection Methods
- Observations and Measurements
- Damage Ratings
- Final Condition Assessment and Recommendation
- Repair Options and Cost Estimates

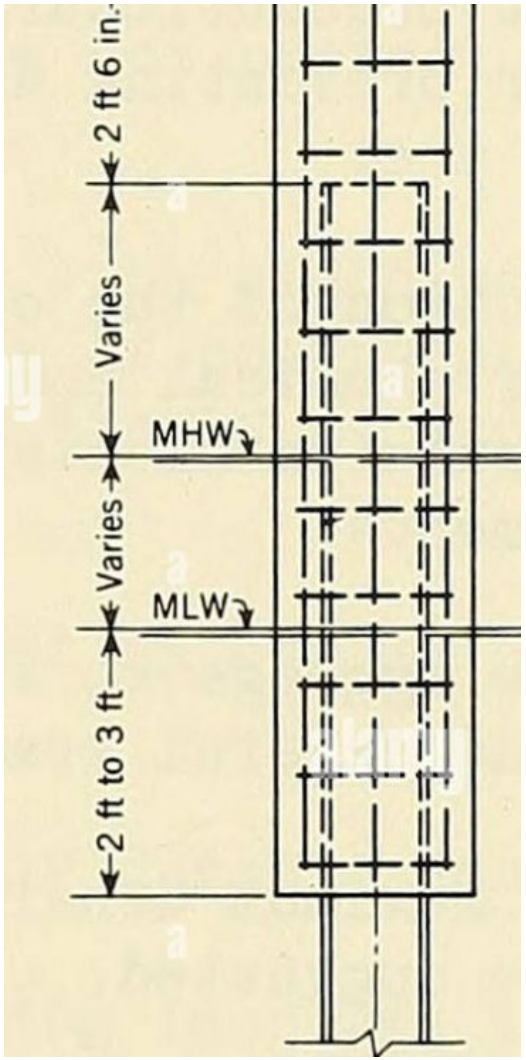
Pier 5 Overview

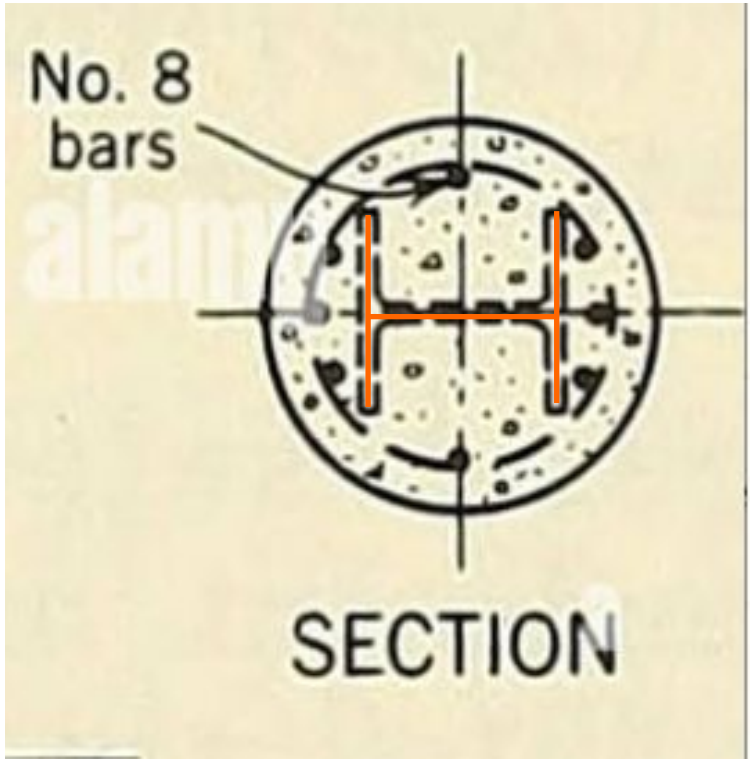


- Built in 1943
- 665’ long by 125’ wide
- Approximately 1,650 spliced steel H-Piles, concrete encased
- In approximately 27’ of water at low tide (MLW)

Pier 5 Overview

- H-Piles – H-shaped steel members. Pier 5 piles are assumed to be H-14x102 piles, approximately 14” “H” made of just under ¾” steel.
- H-Piles originally encase in rebar reinforced concrete.
- Most of concrete has deteriorated, exposing steel H-piles and reinforcing rebar.
- Falling rebar and concrete, and tight spacing of the pilings, limited safe access and inspection to the outer piles.
- H-Piles are not one continuous pile from the deck down to the bottom, but are spliced with welded plates. Typical of WWII construction.





Inspection Methods

- Guidance from ASCE Manuals and Reporting on Engineering Practice
  - Level-I visual inspection on 13% of the elements of the structure, all accessible pile caps and piles.
  - Ultrasonic Thickness (UT) measurements
    - On all accessible piles. About 10% of total structure, 2x the 5% guidance for this measurement
    - UT measurements, non-biased and quantitative, used for H-Pile damage ratings.
    - Conservative method, as most severe damage could be seen below waterline but could not measure
    - More on UT measurements later.

Concrete Pile Cap Damage Ratings

- Pile Caps – Element that transfers the load of the deck to the piles.
- Damage rating is a description of the condition of elements in a structure.
- Standard criteria used.
- Possible ratings range from No Defects to Severe.
- Exposed reinforcement is the primary factor at Pier 5 that puts most of the pile caps into the Major damage rating category.
- Very few pile caps did not have exposed reinforcement.
- Loss of cross section exceeding 30% and structural cracks/breakage wider than ¼” were the leading factors in pile caps rated as Severe.

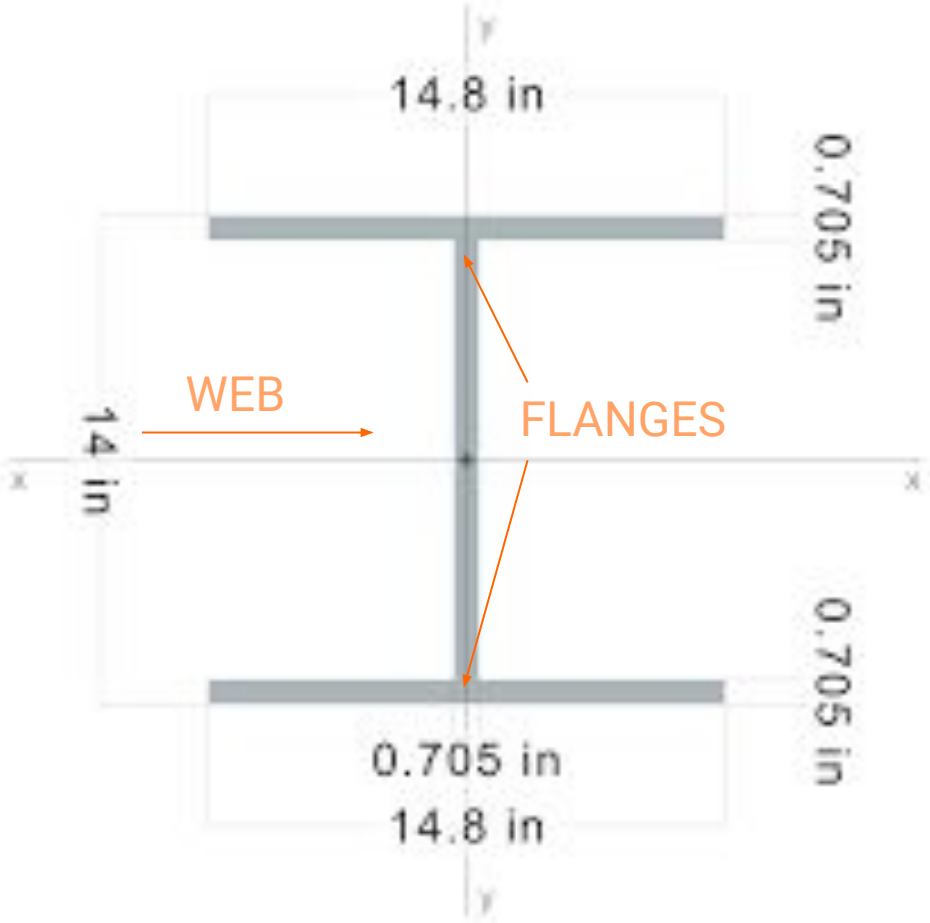
Concrete Pile Cap Damage Rating Examples

Minor Damage
8% of Caps
Small Cracks

Major Damage
74% of Caps
Exposed Reinforcement

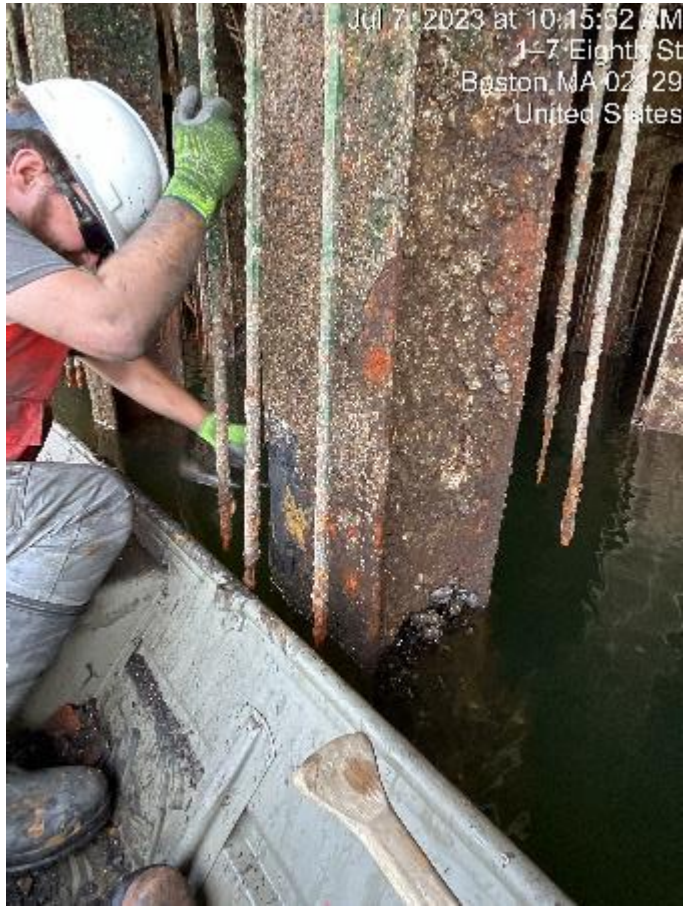
Severe Damage
18% of Caps
>30% Section Loss

UT Measurements for Steel H-Pile Damage Rating



- If concrete was included in assessment, all piles would have been Severe damage minimum since reinforcing rebar is all exposed
- Concrete aspect of the element was ignored, very conservative assessment. Steel H-Pile only
- Started with assumed HP-14x102 thicknesses
- Cleaned surface
- Measured current thickness
- % loss for each pile calculated
- Objective damage rating based on % loss assigned to each pile.

H-Pile Damage Rating Examples



Minor Damage
0%-15% Steel Loss
30% of Piles

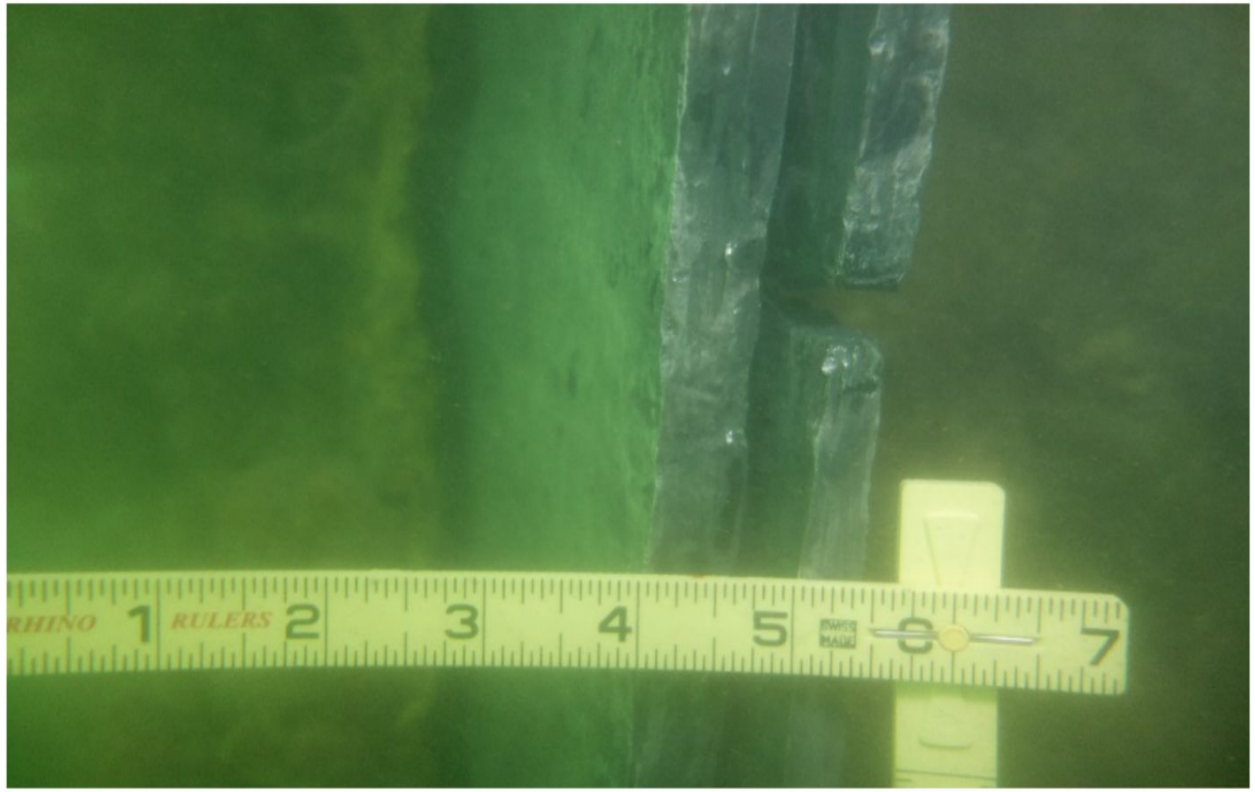
Major Damage
30-50% Steel Loss
21% of Piles

Severe Damage
50%-100% Steel Loss
36% of Piles

Hammering Through H-Pile

Splice Plate Conditions

- 2017 dive inspection showed conditions of total loss of H-Pile splice plate welds.
- Foth final assessment does not use this information.
- Should an alternative requiring rehabilitation of existing piles be pursued, condition of the spliced piles will need further investigation.



Final Condition Assessment Rating

- Condition Assessment Ratings definitions from ASCE WFI 130 were used.
- Based on quantitative measurements of H-Piles and observations, Pier 5 is in Serious condition
- Recommend Pier continues to be closed for public access.

Fair: All primary structural elements are sound, but minor to moderate defects or deterioration was observed. Localized areas of moderate to advanced deterioration may be present but do not significantly reduce the load-bearing capacity of the structure. Repairs recommended, but the priority of the recommended repairs are low.

Poor: Advanced deterioration or overstressing was observed on the widespread portions of the structure but does not significantly reduce the load-bearing capacity of the structure. Repairs may need to be carried out with moderate urgency.

Serious: Advanced deterioration overstressing, or breakage may have significantly affected the load-bearing capacity of primary structural components. Local failures are possible and loading restriction may be necessary. Repairs may be carried out on a high-priority basis with urgency.

Critical: Very advanced deterioration, overstressing or breakage has resulted in localized failure(s) of primary structure components. More widespread failures are possible or likely to occur, and load restrictions should be implemented as necessary. Repairs may need to be carried out on a very high priority basis with strong urgency.

Program Alternatives, Structural Action Options

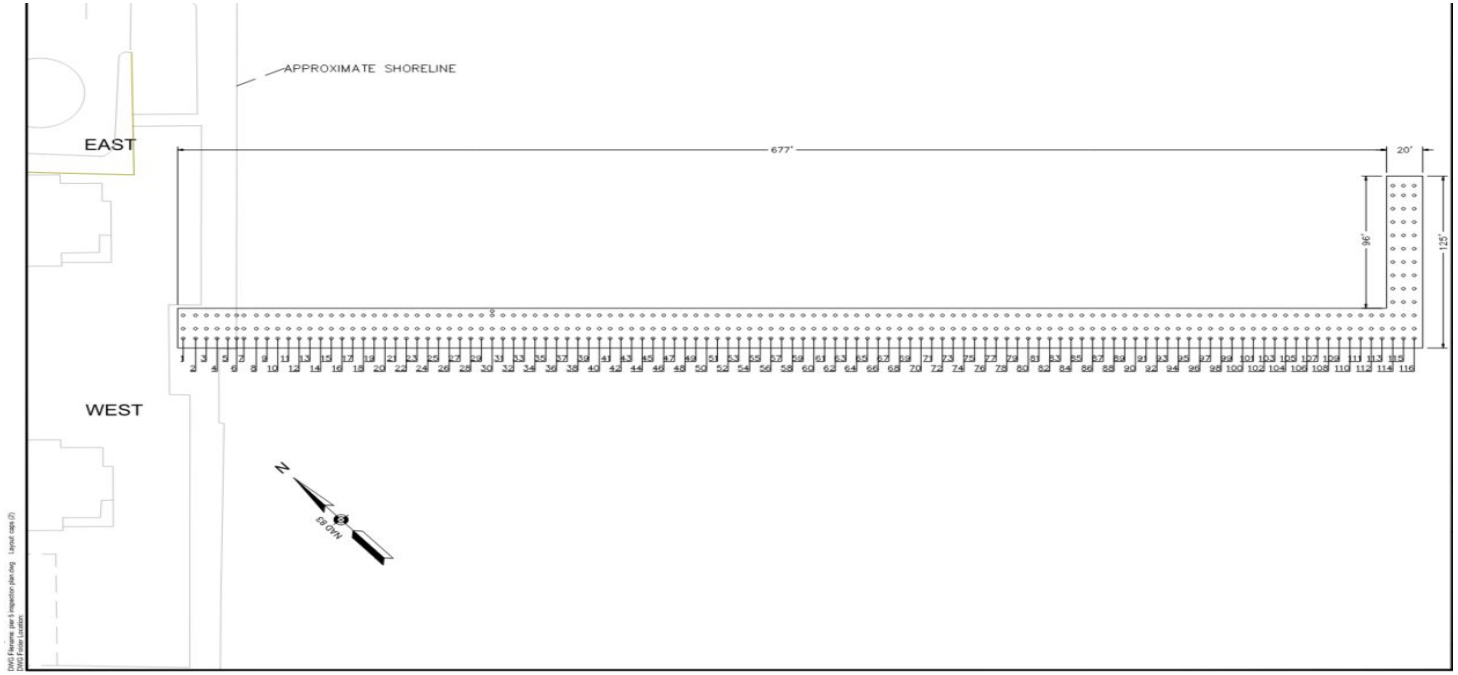
- 3 Programs to be Considered
  - Program A – Safe Public Access
  - Program B – Public Park/Open Space w/ Sailing Center
  - Program C – Demolition and complete removal of the pier to create an open water sheet for future development.
- Structural Options Considered for Preliminary Cost Estimates
  - Full Repair of the Entire Pier 5 Footprint
  - Partial Demolition and L-Shape Repair
  - Full Demolition and L-Shape New Construction
  - Full Demolition and Watersheet Use

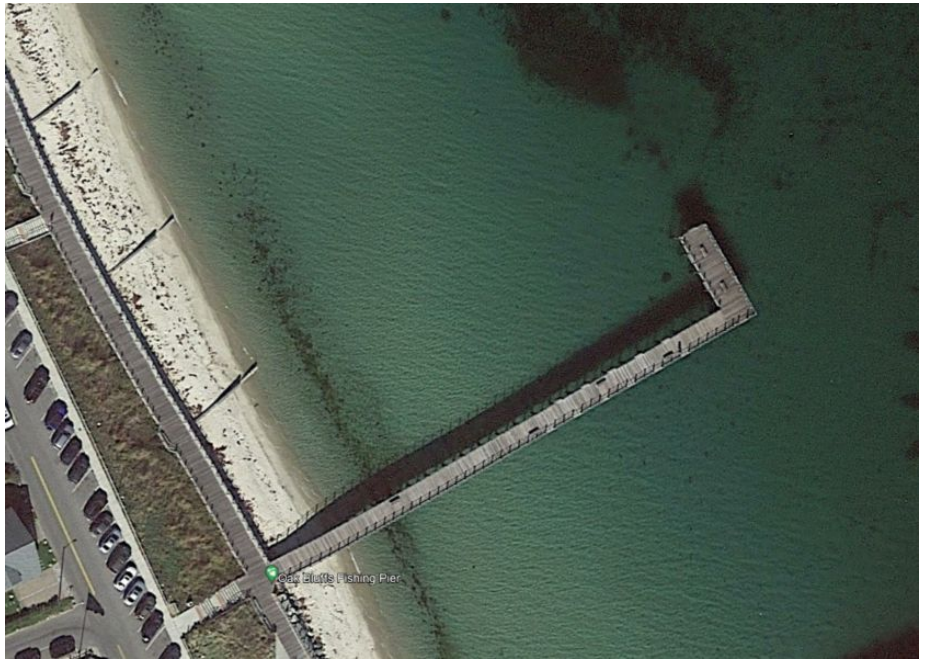
Full Structural Repair Option

- Assumes bringing pier to pedestrian loading, no park or structures
- Full repair of the entire Pier 5 Footprint
- Non-Traditional or “QuakeWrap” Fiberglass Jackets - $18,500,000 – Lack of local use and experienced marine contractors.
- Traditional Jackets - $32,900,000
- Non-Traditional CarboShield - $29,800,000 – Used at Pier 4

L-Shape Pier Options

- Pedestrian Loading
- Full demolition with L-Shaped reconstruction - $10,800,000
- Partial demolition with L-Shaped non-traditional repair - $15,900,000
- Partial demolition with L-Shaped CarboShield repair - $14,600,000





Full Demolition with Floating Marina

- Main central floats approximately 550’ long
- Assumes 20 finger floats, 10 on each side.
- $11,200,000

Cost Estimate Summary

Structural Option		Cost Estimate
Full Pier Repair	Full Pier Footprint Repair, Non-Traditional Jackets	$ 18,500,000
	Full Pier Footprint Repair, Traditional Jackets	$ 32,900,000
	Full Pier Footprint Repair, Non-Traditional CarboShield	$ 29,800,000
"L-Shaped" Pier	Repair, Non-Traditional Jackets	$ 15,900,000
	Repair, Non-Traditional CarboShield	$ 14,600,000
	Full Demolition and Replacement	$ 10,800,000
Full Demolition	Full Demolition and Floating Marina Installation	$ 11,200,000

Visioning Session for the Redevelopment Strategy

boston planning & development agency

Summary Slide

Waterfront Planning

- Chapter 91 Requirements: Ground floor must be dedicated to public use.
- Coastal Resilience Solutions for East Boston and Charlestown Phase II: Raised Harborwalk in Navy Yard to 13 ft NAVD88 (short term) to 15 ft NAVD88 (long term) must have a tie in to Pier 5.

Engineering Report

- Pier 5 is in "Serious" condition, which technically means that there is advanced deterioration.
- Design concepts and cost estimates were provided for 3 programs:
  - Program A: improves existing pier for pedestrians
  - Program B: improves existing pier for public park and sailing center
  - Program C: demolition of existing pier to create a watersheet for future potential uses
- Average cost per program
  - Full Pier Repair = $18.5 - $32.9 million
  - L Shaped Pier = $10.8 - $15.9 million
  - Floating Marina = $11.2 million

What we want to hear from you!

- How would you like to see climate resilience incorporated into the future redevelopment of Pier 5?
- What uses would you like to see at Pier 5? (park, pedestrian walkway, marina, etc.)
- How can the redevelopment of Pier 5 best serve the Charlestown community?

Next Steps

boston planning &
development agency

Expected Timeline

Time	Step
Tonight	Hold community meeting Post the Engineering report live on the Pier 5 website Launch public comment period
Spring 2024	Hold community meeting about development guidelines for the Disposition RFP
Early Summer 2024	Release Disposition RFP
Late Summer 2024	Receive proposals from the Disposition RFP
Fall 2024	Hold community meeting to present the proposals

Thank you!

Questions?

Email Natalie Deduck at natalie.deduck@boston.gov