MRMCA
MARYLAND READY MIX CONCRETE ASSOCIATION

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Historic Pier Restoration

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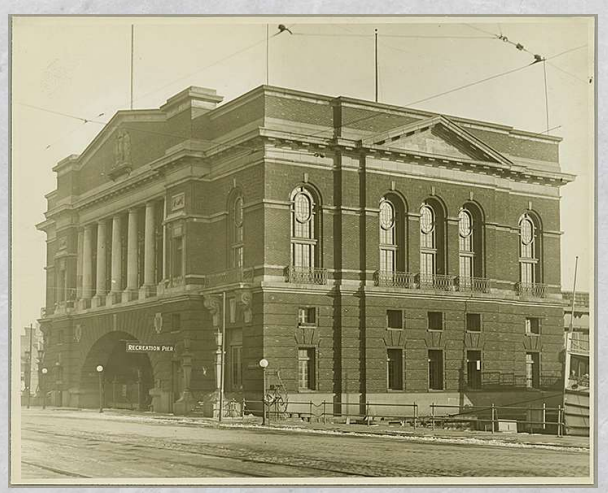
Whitney, Bailey, Cox & Magnani, LLC (WBCM)

WBCM

MAKE A CONCRETE DECISION.

Transformation

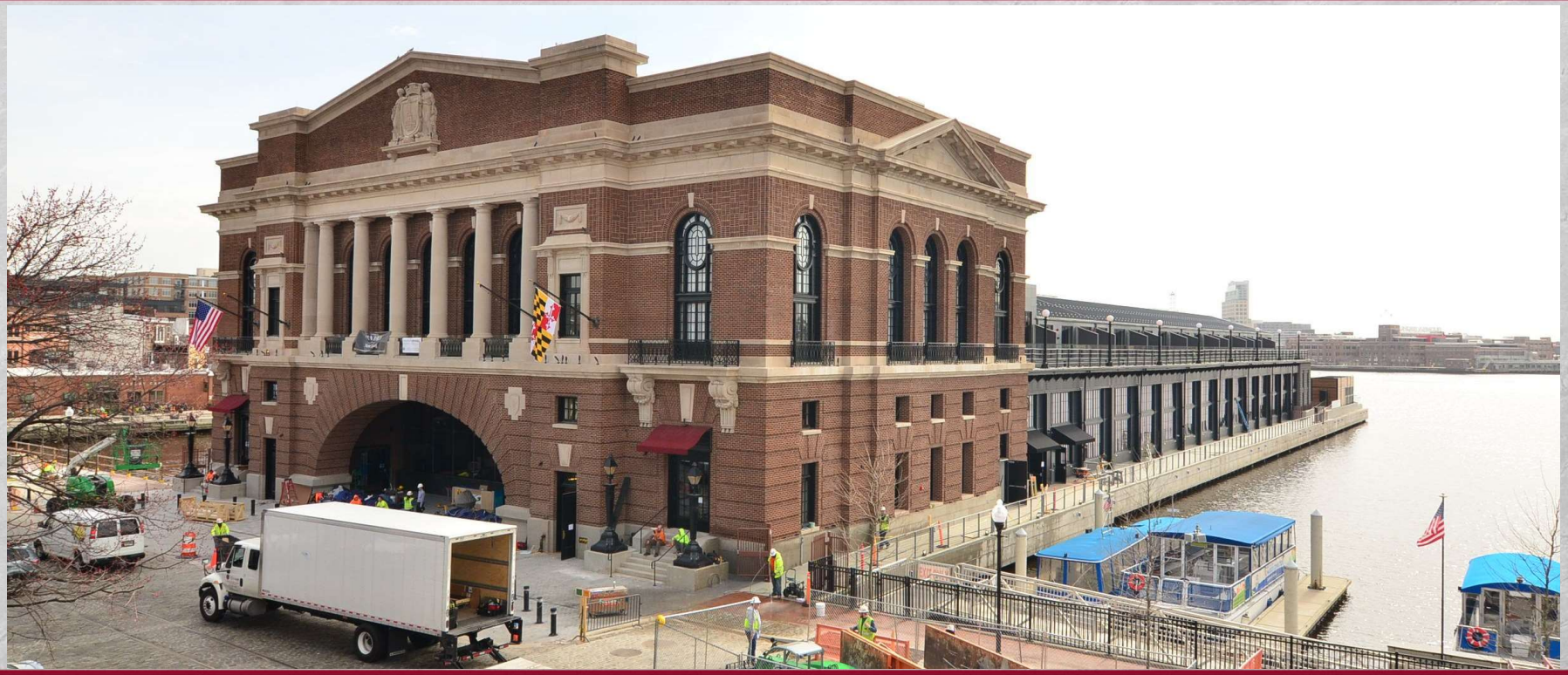


Recreation Pier
(1914)

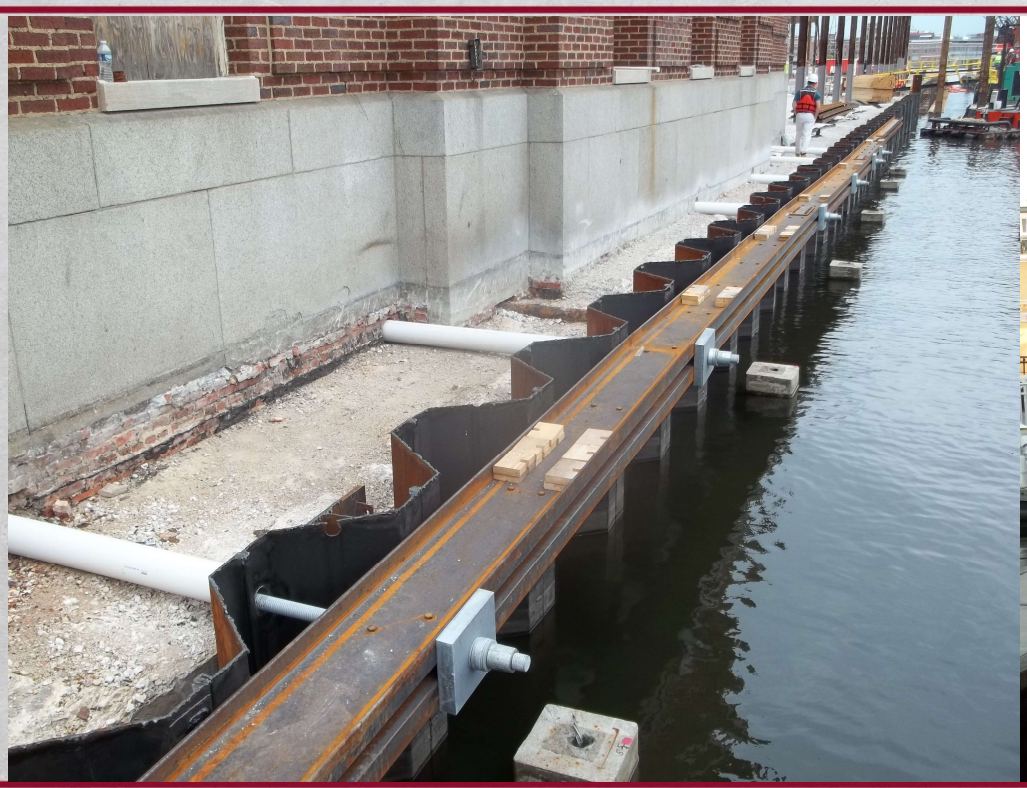
Sagamore Pendry Baltimore
(2017)

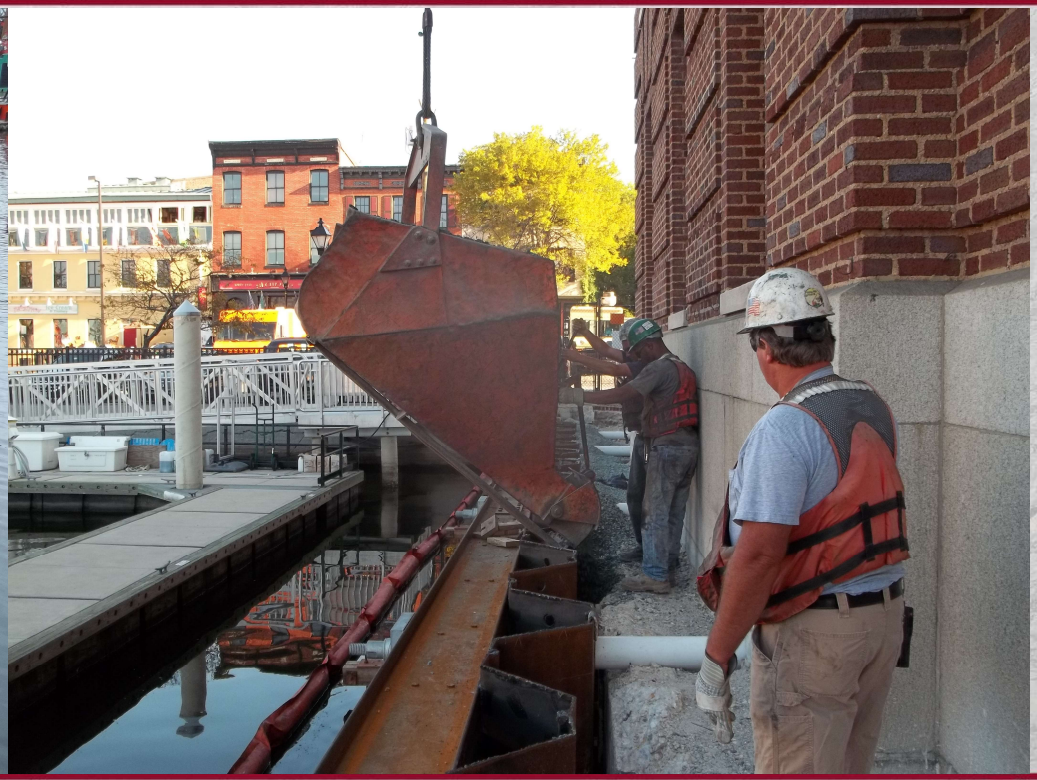
The Recreation Pier

Overview: Restored Headhouse



New Steel Sheet Pile Wall Around Fastland

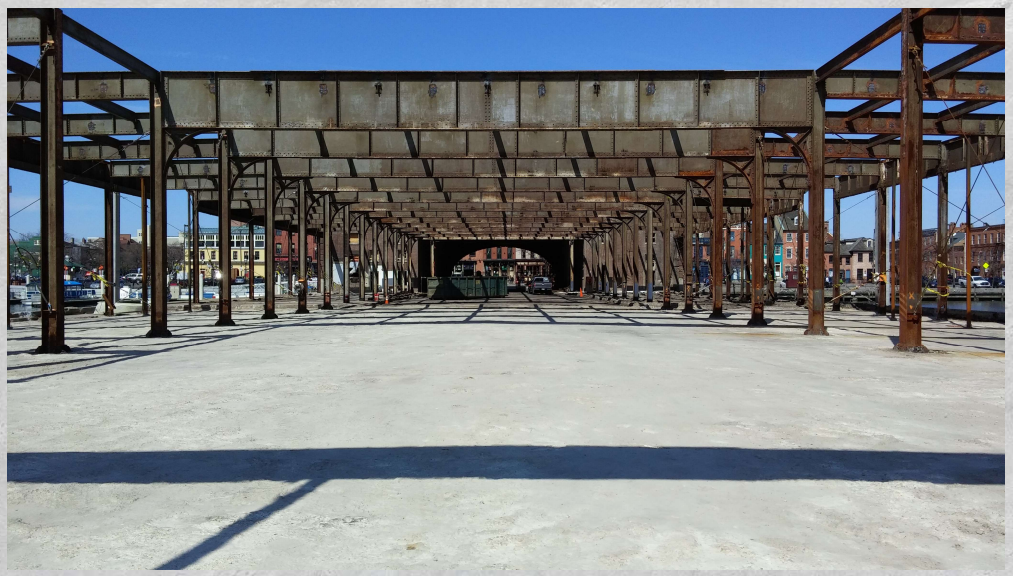




Restoration of Existing Pier

Preservation of Historic Steel Framing

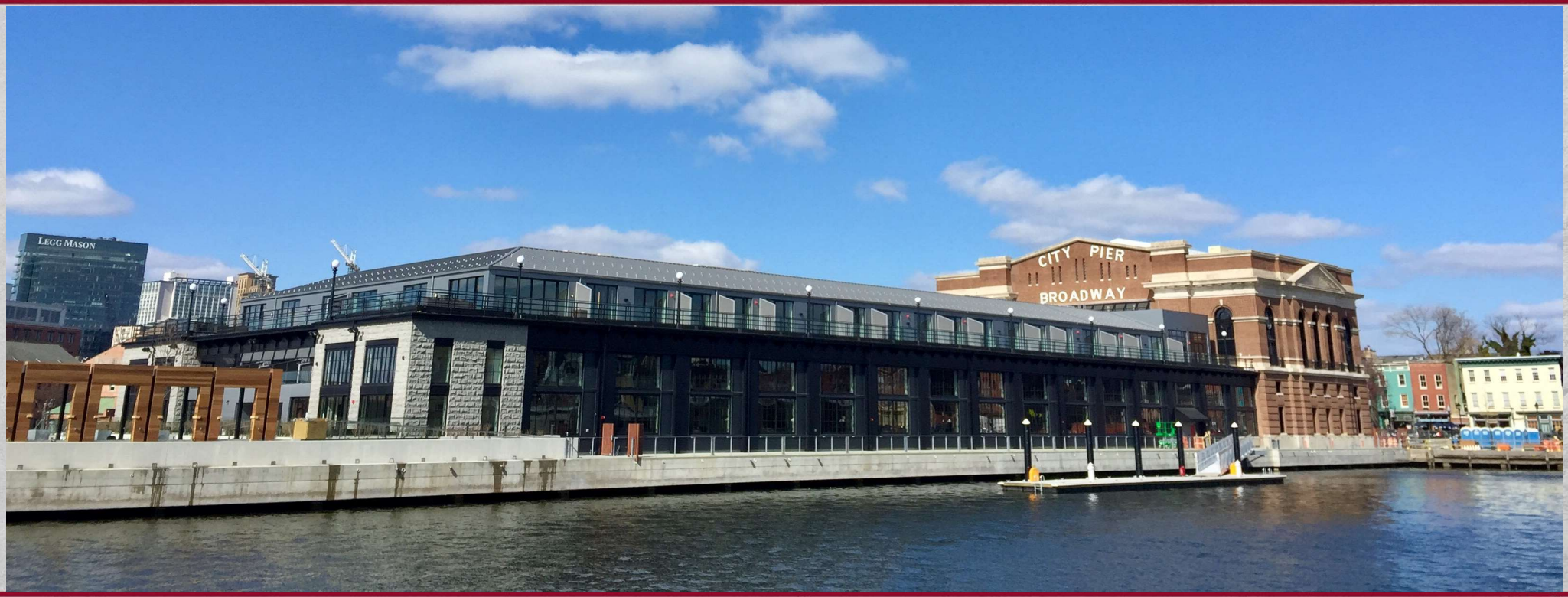
Historic Riveted Steel Framing



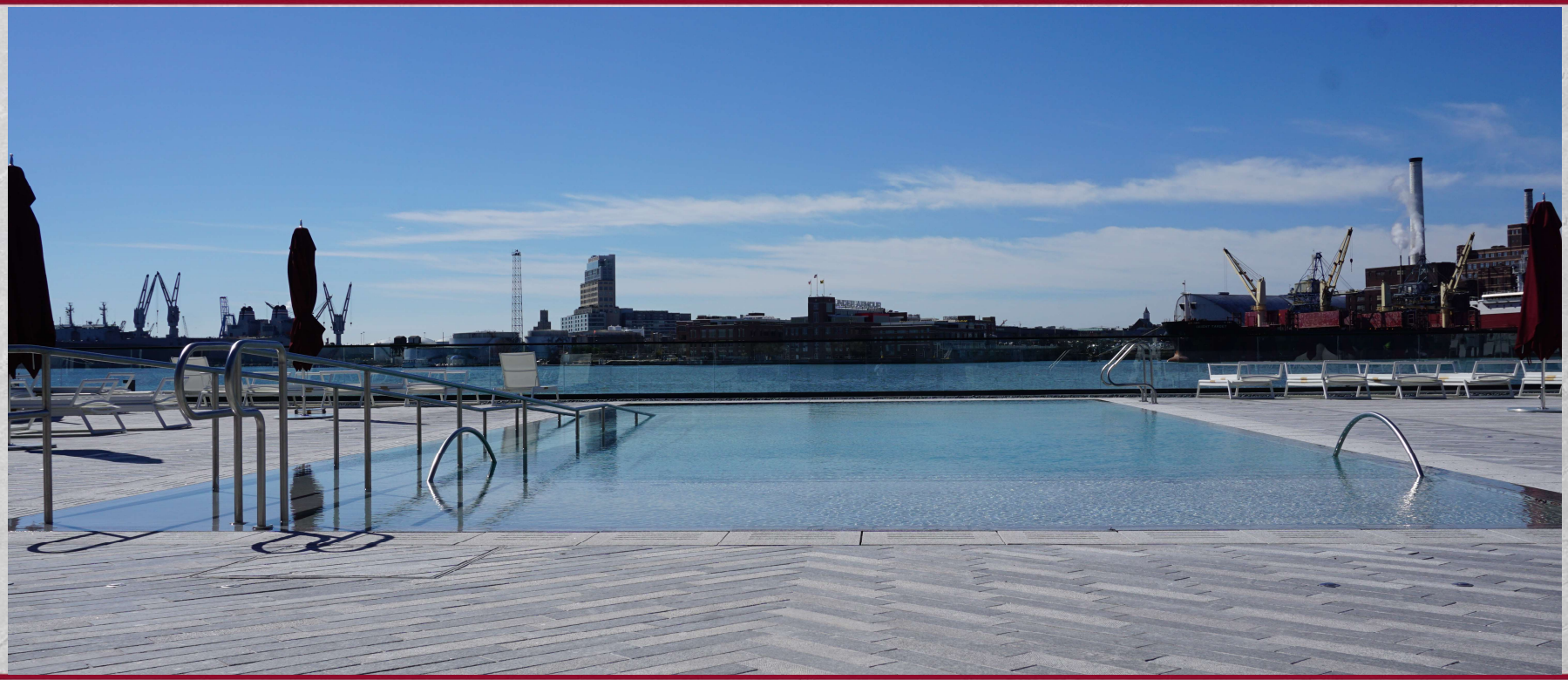
Before

After

New Hotel Rooms



New Infinity Pool



Intro: Why this Project?

Important Lessons:

1. “Those who do not learn history are doomed to repeat it” *(generally attributed to philosopher George Santayana).*
2. Flexible design
3. Optimizing design

Historic Preservation

History belongs on display, because people need its lessons.

Uses of history on this project:

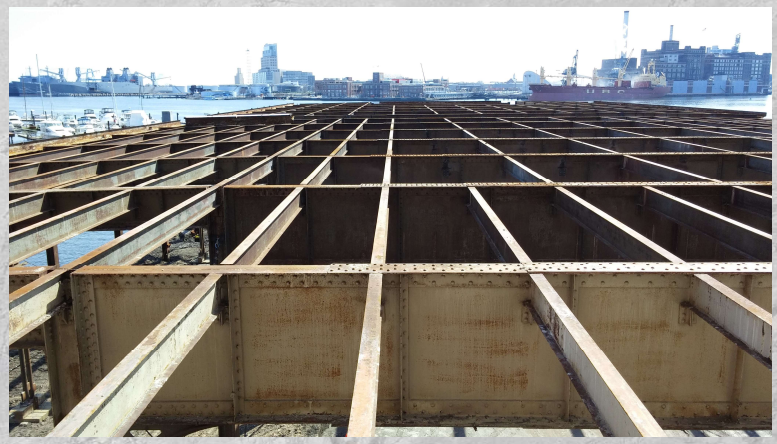
- Record documents of existing construction
- Funding from historic interest groups
- Historic forecasting of flood and tidal elevations
- Lessons from experience with similar construction methods.

Historic Preservation

History improves a project's significance.

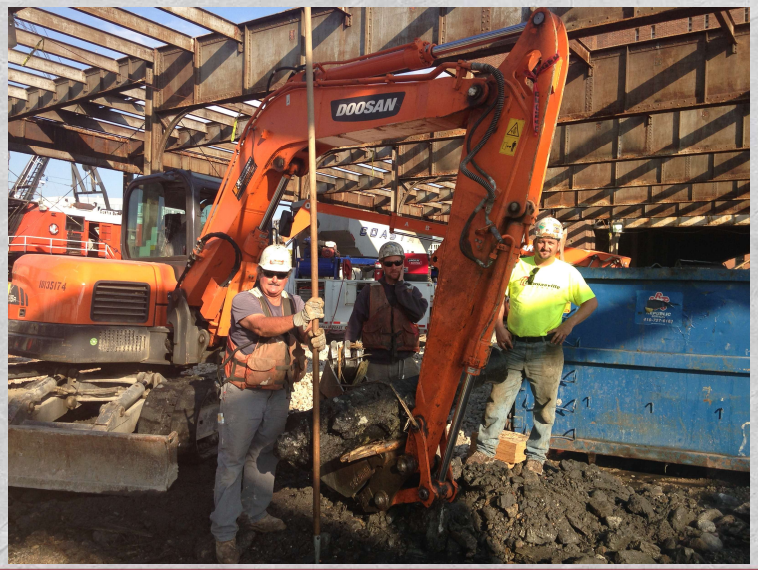
<u>Preserved history on this project:</u>

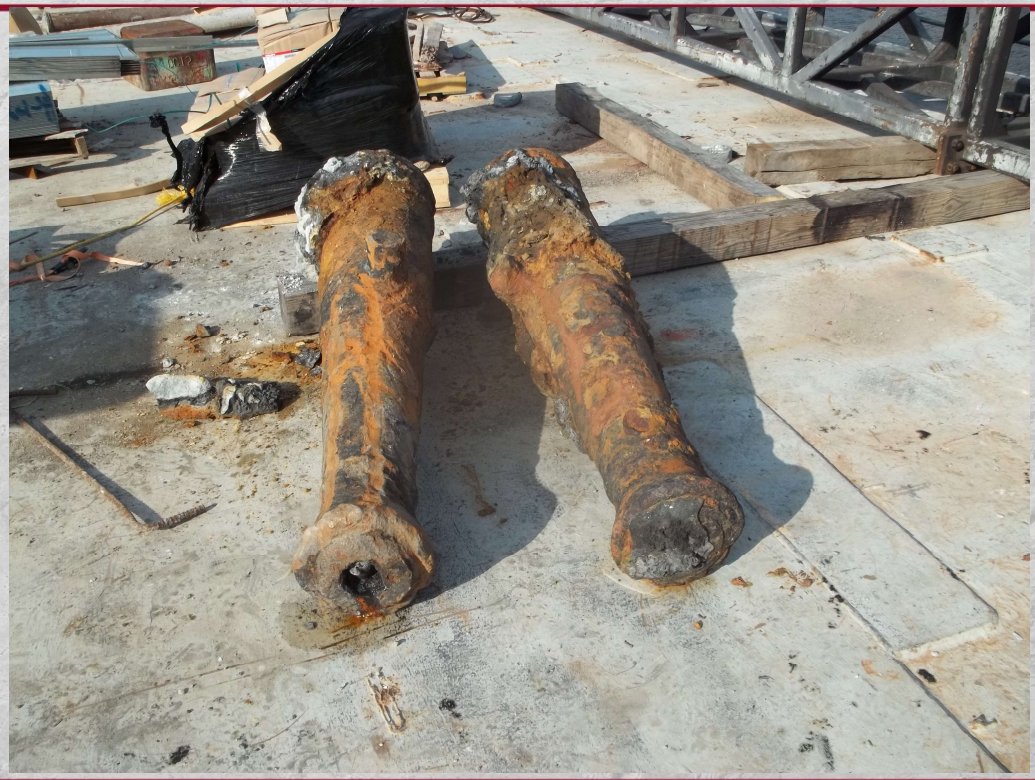
- Historic headhouse building
- Historic concrete pier and riveted steel framing
- Artifacts found during construction



Historic Preservation

Historic Artifacts:
(3) 1700s Era French Cannons





Historic Preservation

Funding & Commerce: Customers will pay to experience history.

Preservation advantages on this project:

- Maryland Historic Trust credit
- Premium guest fees
- Community support instead of resistance

Flexible Design

Ductility should be considered in more than structural behavior.

- Anticipate installation failures on difficult installations.
- Anticipate obstructions when they may be present.
- Create a mitigation plan before construction starts.

Flexible Design Example #1

Problem: Installing grouted soil anchors in congested drilling area.

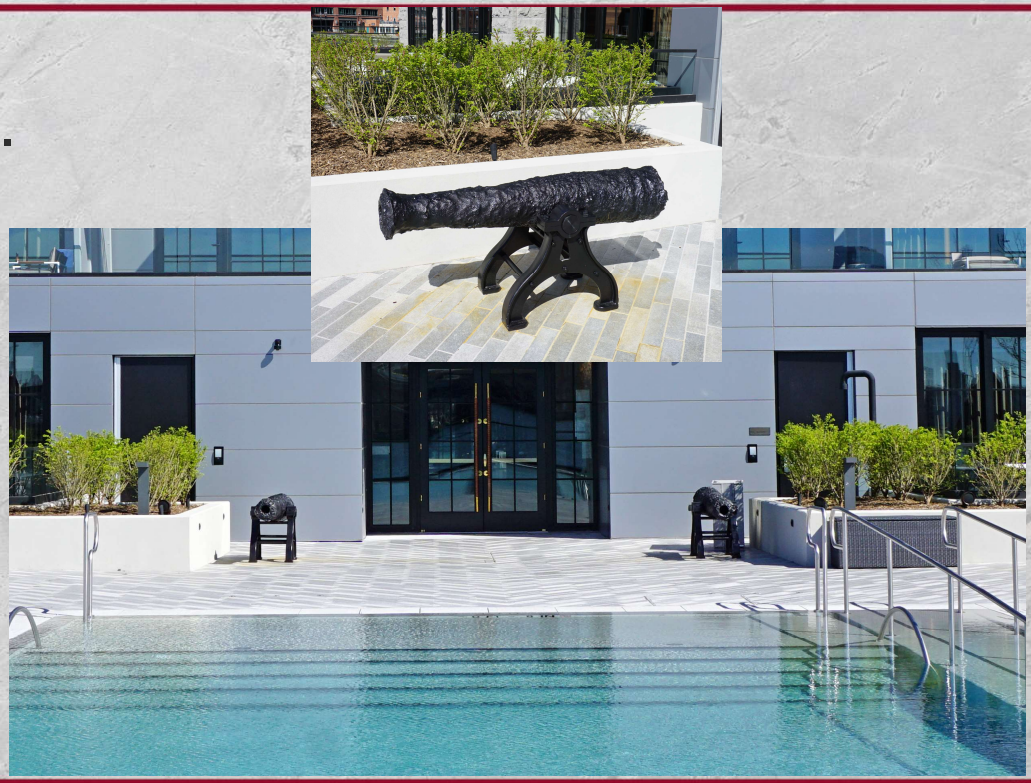
Solution: Design secondary drilling locations.

Flexible Design Example #2

Problem: Driving sheet piling through fill with suspected obstacles.

<u>Solutions:</u>

1. Design wide tolerance in the sheet pile wall alignment.
2. Negotiate a daily rate for removing obstructions up front.
3. Why not display any unanticipated treasure you find?



Optimizing Design

There is always another way. Did you consider it?

<u>Project Design Improvements Implemented:</u>

- Testing instead of guessing
- Better materials
- Better construction methods

Optimizing Design Example #1

Pay more now and much less later.

<u>Testing instead of guessing:</u>

- Pile Integrity Testing (PIT)
- Test pitting
- Test pile program
- Load testing

Optimizing Design Example #2

It's ok to second guess your design sometimes.

<u>Concrete was the better material:</u>

- $1 Million savings using concrete piles in lieu of the originally proposed steel piles.
- Better corrosion resistance
- SCMs for enhanced durability

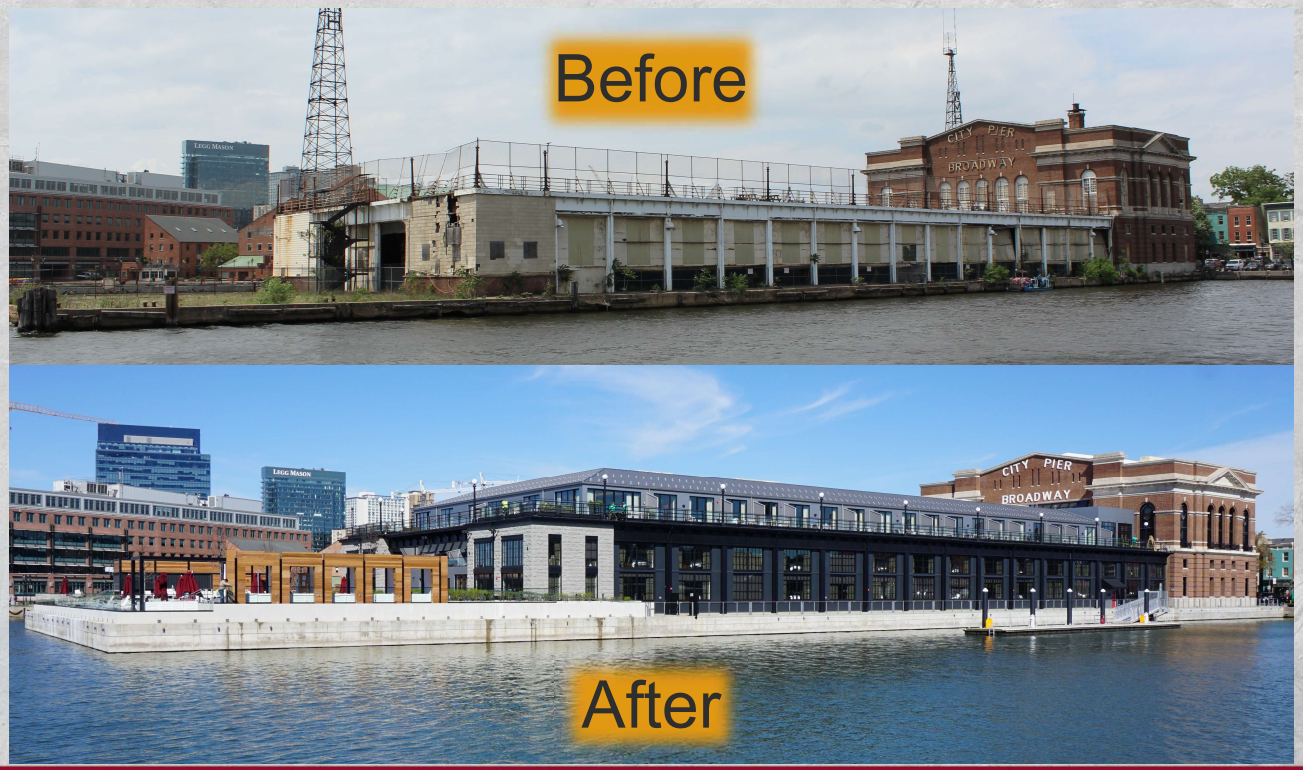
Optimizing Design Example #3

Early Contractor selection can save the schedule and budget on challenging projects.

Better construction methods:

- Integrated Project Delivery
- Precast versus cast-in-place concrete pool structure

Final Results



Key Takeaways

1. **How can you incorporate history into your current projects?**
2. **How can you mitigate installation errors on one of your projects?**
3. **There is always more than one solution to a problem. Have you considered a second or third solution to the problem on your project?**

Awards

- ENR Mid-Atlantic - Best Project
- ACI Maryland - Excellence in Concrete
- AIA Maryland – Award of Excellence
- Engineering Society of Baltimore – Project of the Year
- 2018 Baltimore Heritage – Historic Preservation Award for Adaptive Reuse
- AIA New York – Award of Excellence

AIA Maryland

aci
American Concrete Institute
MARYLAND CHAPTER

AIA New York State

Acknowledgements

- Project Leadership
  - Mark Shafer, PE, Principal Emeritus, WBCM
  - Doug Suess, PE, Principal Emeritus, WBCM
- WBCM Marine/Industrial team
- Schnabel Engineering (Geotechnical Engineer)
- McLean Contracting, Inc. (General Contractor)

Questions?