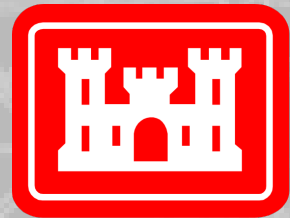


# NORFOLK COASTAL STORM RISK MANAGEMENT

## Phase 1 Project Introduction

Presented by:  
Holly N. Berckenhoff, PE  
USACE Norfolk District

Date: 19 April 2023



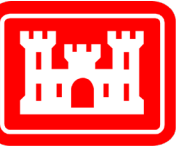
**US Army Corps  
of Engineers®**



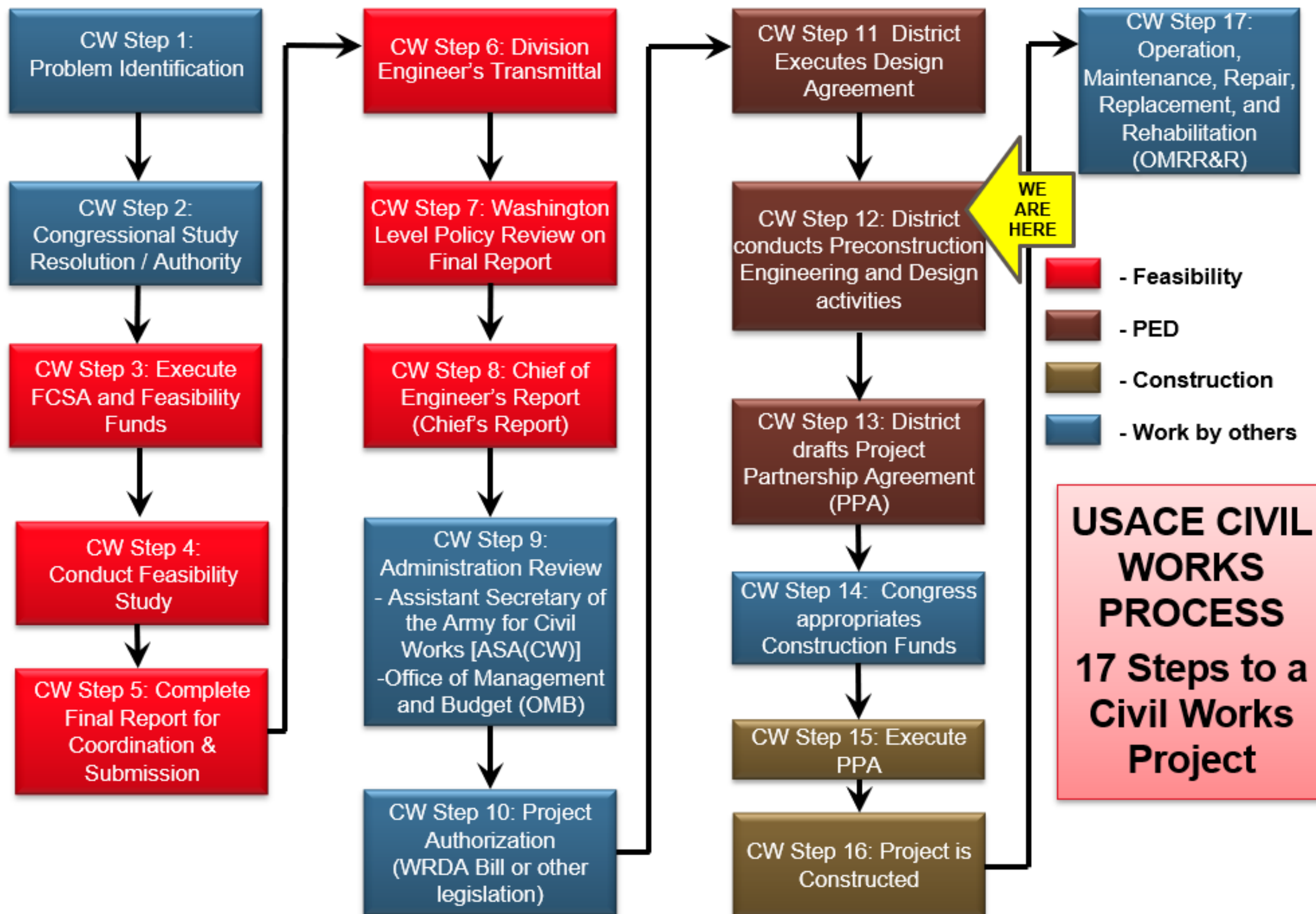
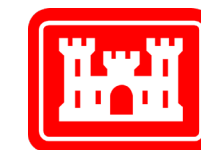




# THE USACE CIVIL WORKS PROCESS



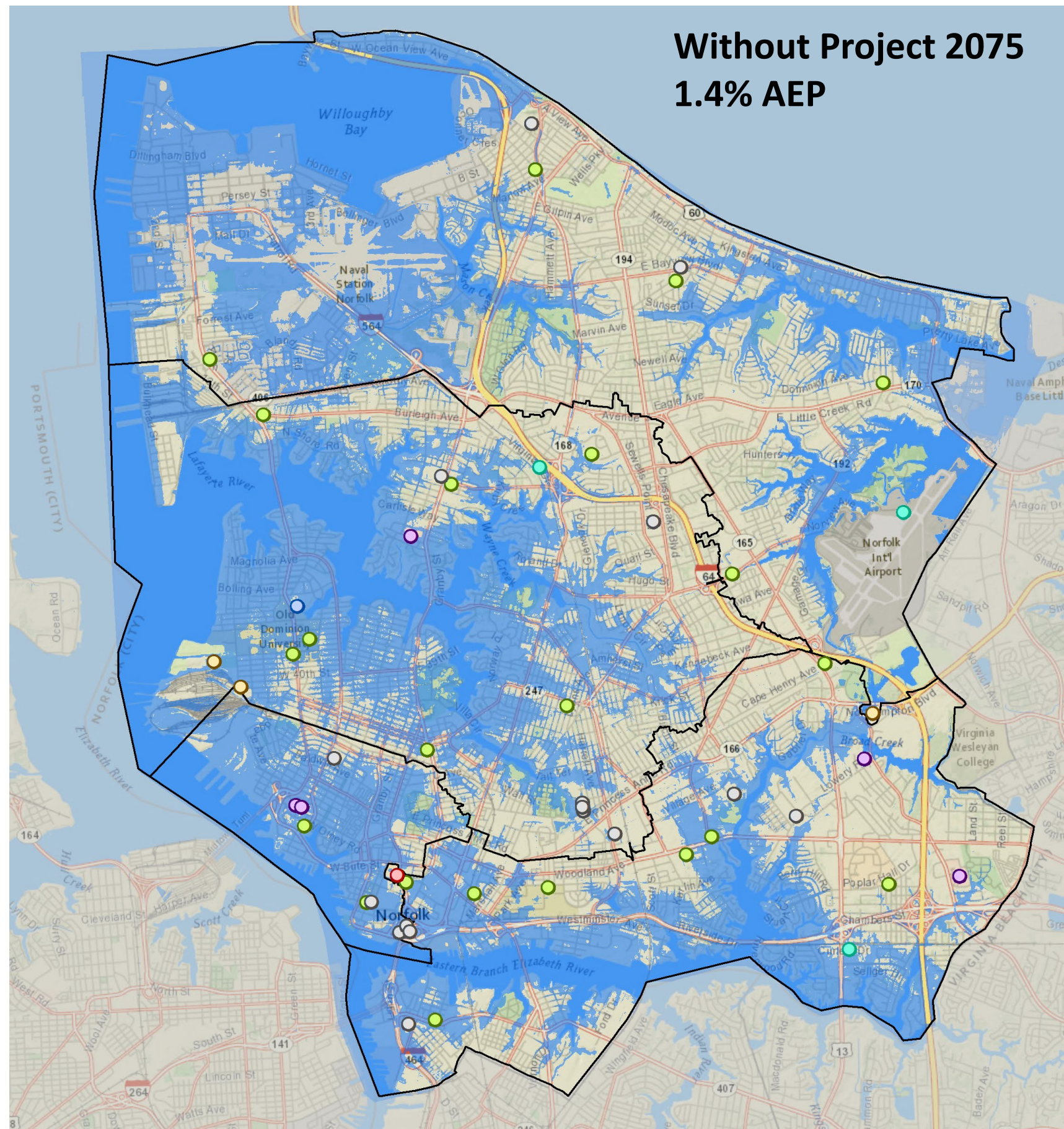
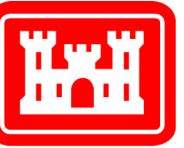
- Informs Congress as it makes decisions for authorizing and funding water resources investments for the nation
- Studies are authorized by Congress to address water resource problems related to coastal storm risk management, flood risk management, navigation, and/or ecosystem restoration
- A feasibility study is completed to identify a project to address the water resource problem(s)
  - The recommended project is authorized by Congress
  - Congress appropriates funding for the design and construction of authorized projects
  - There are 17 steps to “Project Completion.”







# INUNDATION OF ROADWAYS AND CRITICAL INFRASTRUCTURE



- Levee
- Surge Barriers
- Floodwall
- Tide Gate
- Pump Station
- Commercial Facilities
- Emergency Services Sector
- Government Facilities Sector
- Health Care and Public Health Sector
- Transportation Sector
- Water and Wastewater Systems Sector
- NACCS 2075 1.4% Inundation

**Note:** Assumes USACE Intermediate RSLC increase of 1.45 ft. from 2016

**AEP** = Annual Exceedance Probability

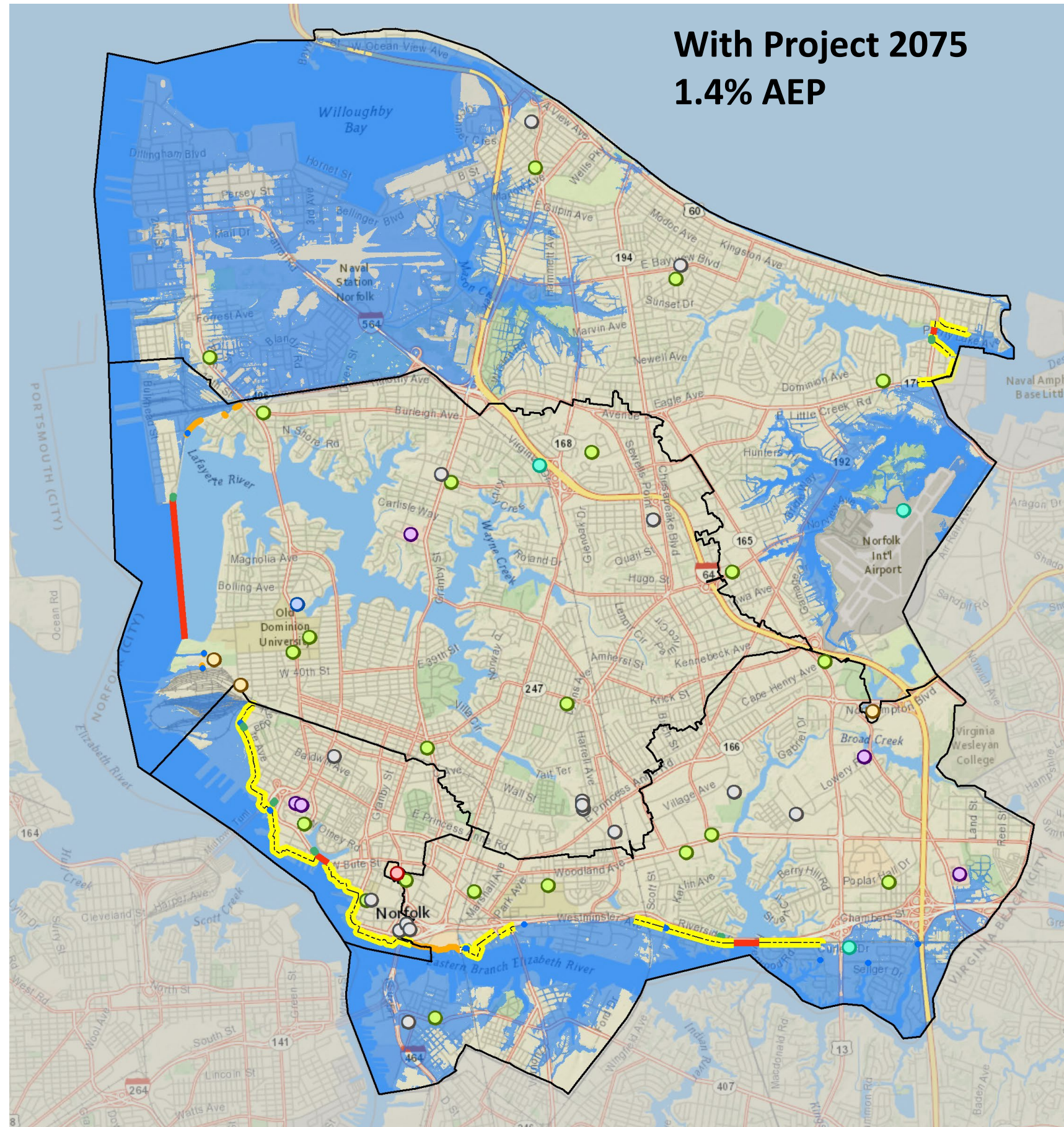
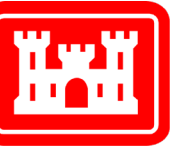
**NACCS** = North Atlantic Coast Comprehensive Study

**RSLC** = Relative Sea Level Change





# INUNDATION OF ROADWAYS AND CRITICAL INFRASTRUCTURE



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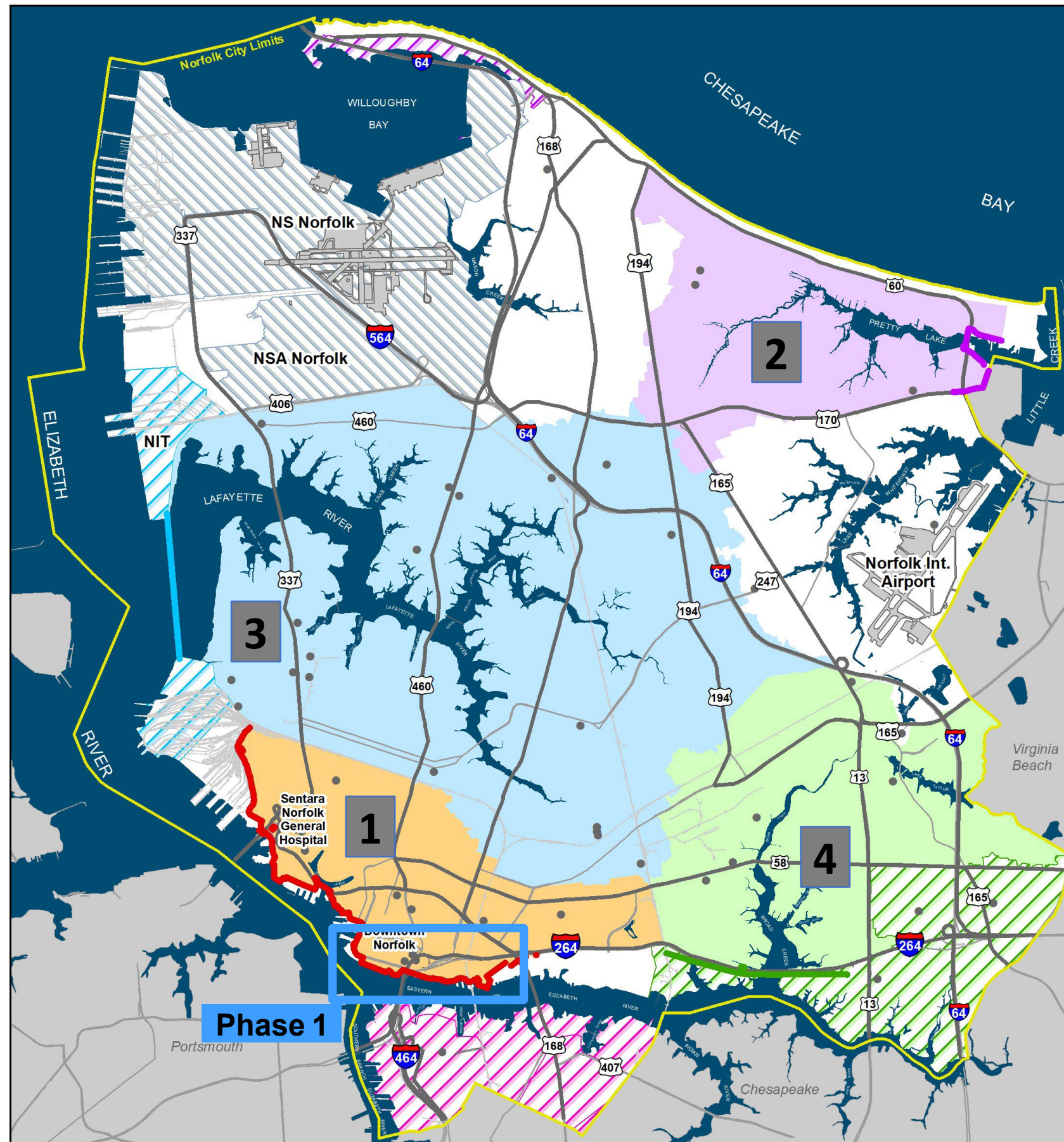
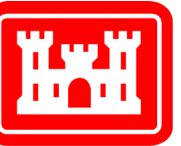
**NACCS** = North Atlantic Coast Comprehensive Study

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# OVERALL NORFOLK CSRM PROJECT SCOPE



## City's Priorities for Construction Sequence:

1 Area 1 Ghent-Downtown-Harbor Park

2 Area 2 Pretty Lake

3 Area 3 Lafayette

4 Area 4 Broad Creek

 Non-Structural (concurrent to other work)

## LEGEND

### Structural Flood Risk Management Measures

-  Ghent-Downtown-Harbor Park
-  Pretty Lake Surge Barrier
-  Lafayette Outer Surge Barrier
-  Broad Creek Surge Barrier

### Structural Measures Risk Management Area

*Hatched Area Indicates Non-Structural Measures*

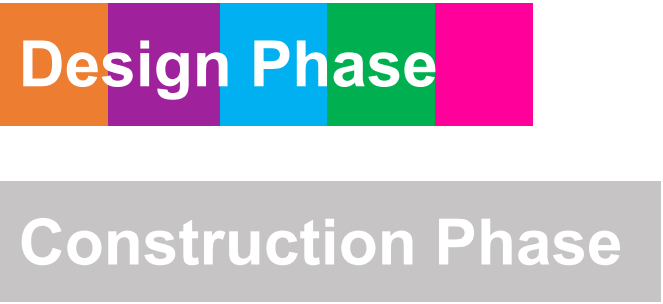
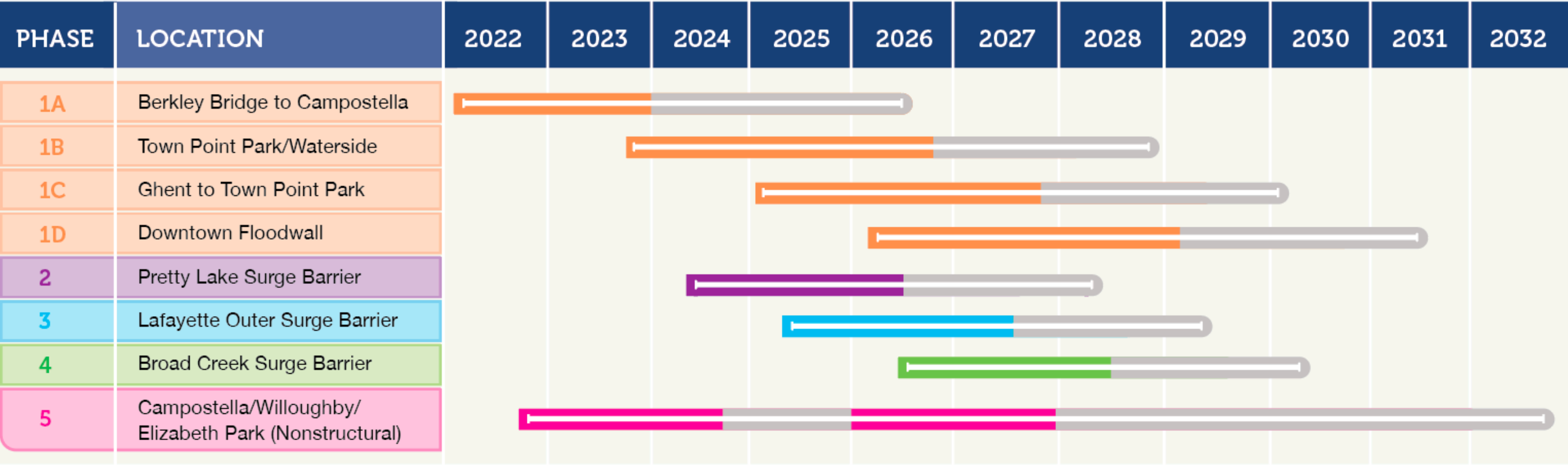
-  Ghent-Downtown-Harbor Park
-  Pretty Lake Surge Barrier
-  Lafayette Outer Surge Barrier
-  Broad Creek Surge Barrier

 Non-Structural Measures throughout City of Norfolk:  
Berkley, Campostella, Elizabeth Park, Ingleside, Norfolk International Terminals (NIT), Willoughby

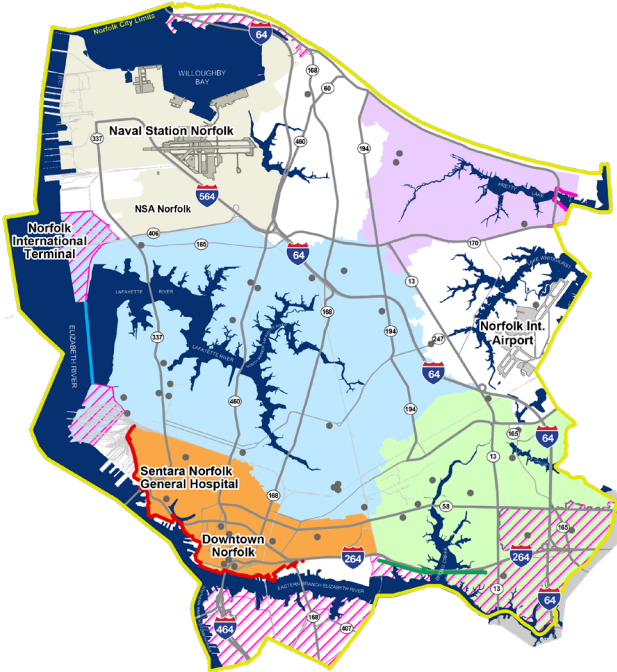




# PROJECT TIMELINE



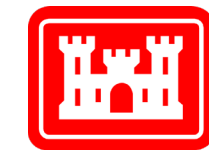
Project phase map:







# PHASE 1A + 1B PLAN



Phase 1B

Phase 1A



NORFOLK CSRM PHASE 1

FLOOD PROTECTION  
SYSTEM ALIGNMENT



LEVEE  
FLOOD WALL  
CLOSURE



PUMP STATION  
LIVING SHORELINE

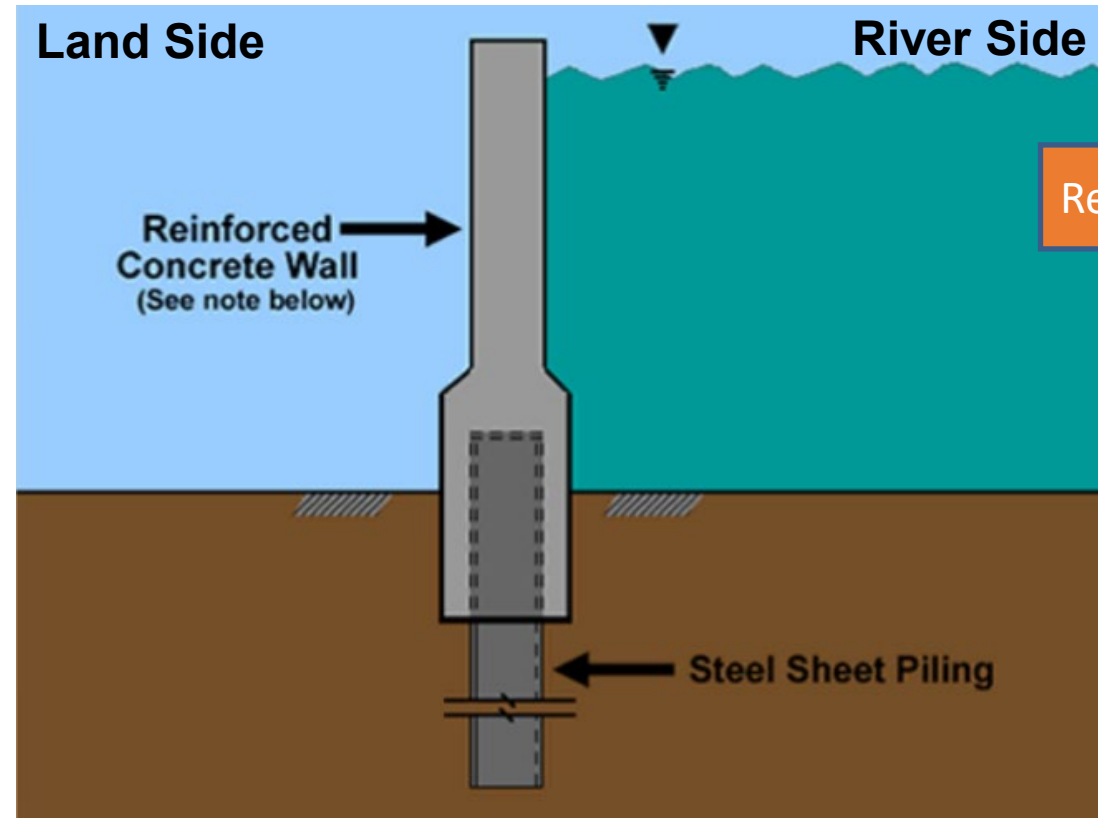




# TYPES OF FLOOD PROTECTION

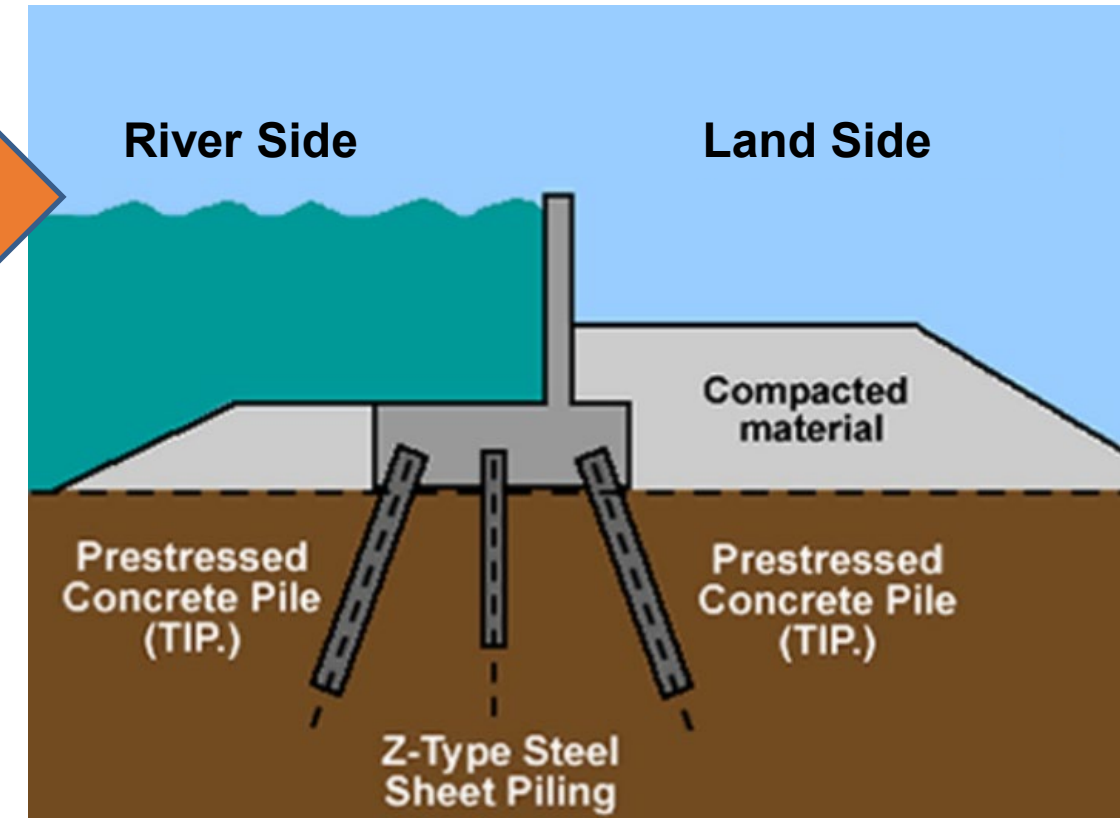


**I-wall**  
(Existing  
Downtown  
Flood Wall)

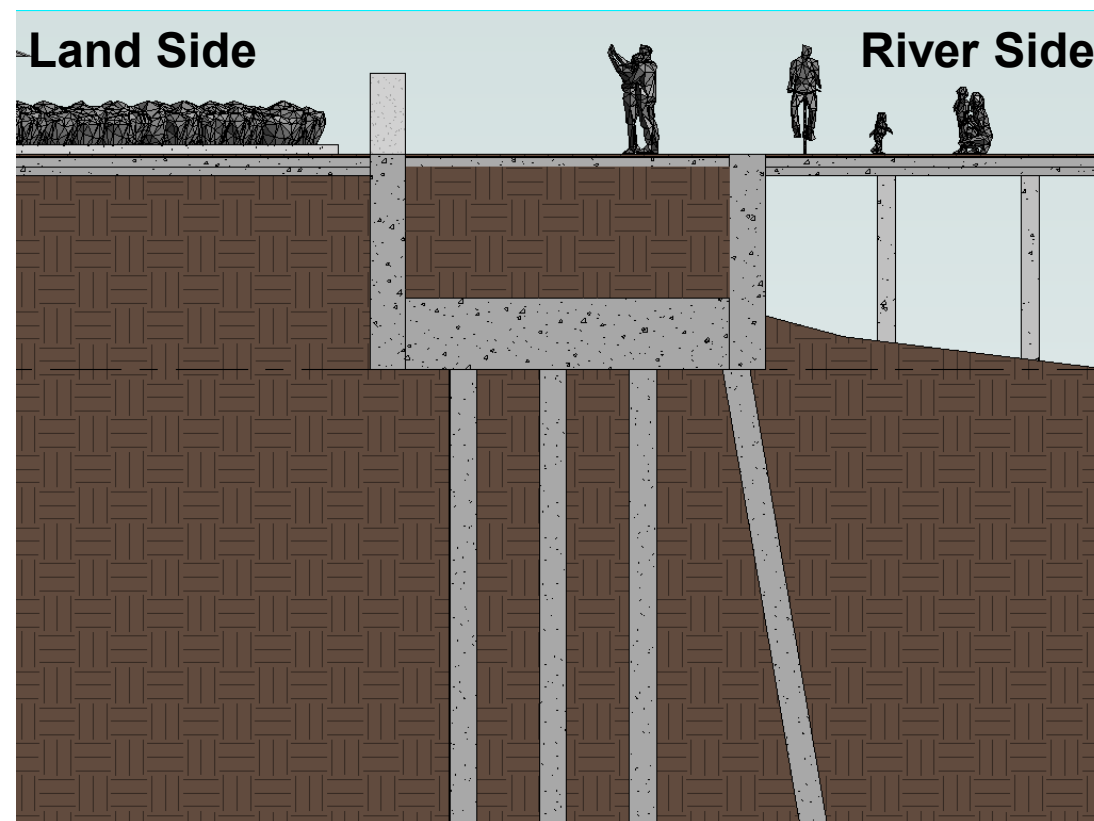


Replace existing I-wall with T-wall

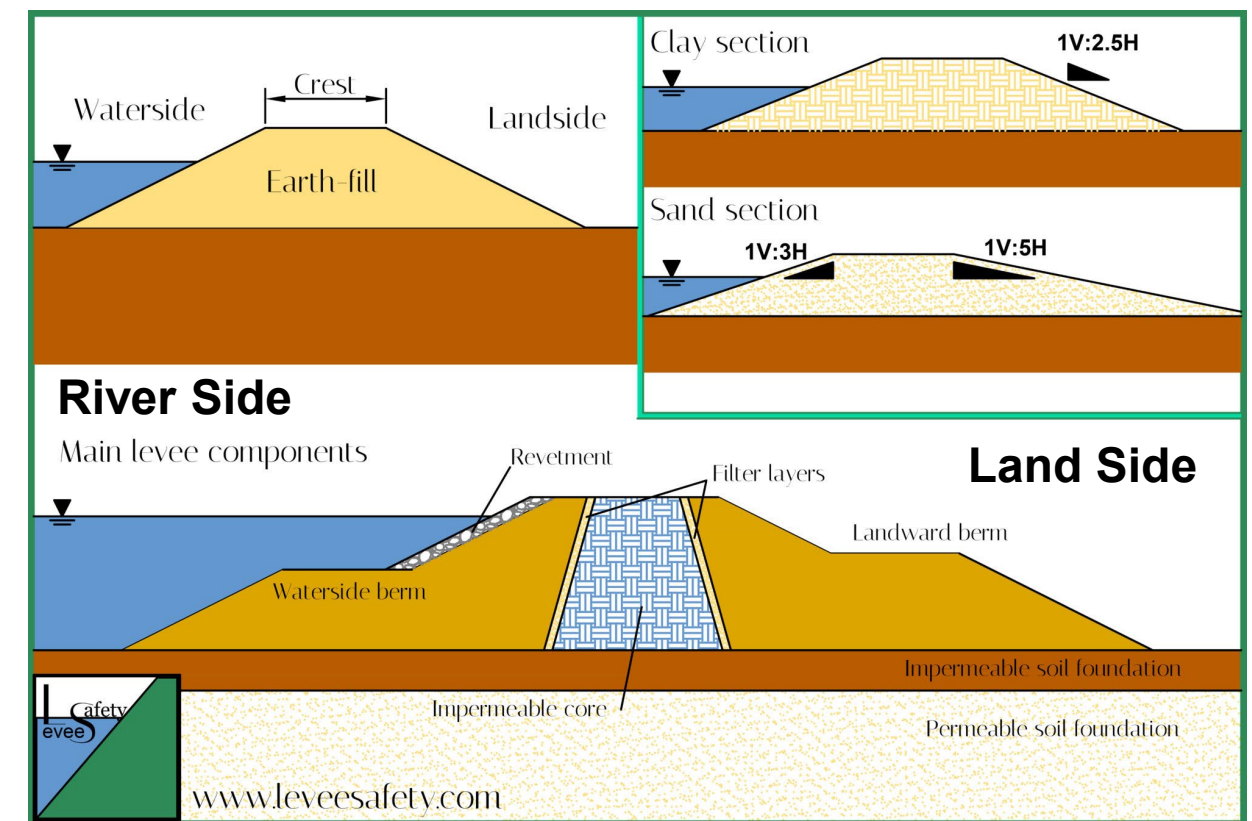
**T-wall**



**Bin  
wall**



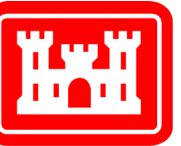
**Levee**



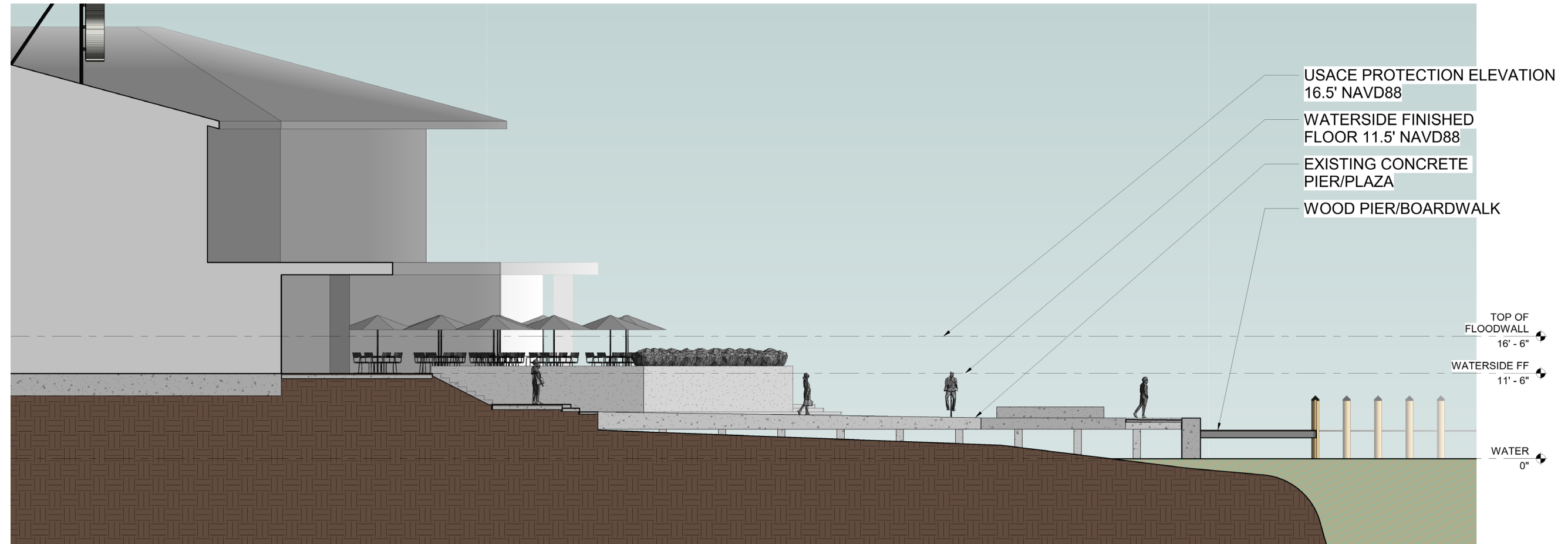




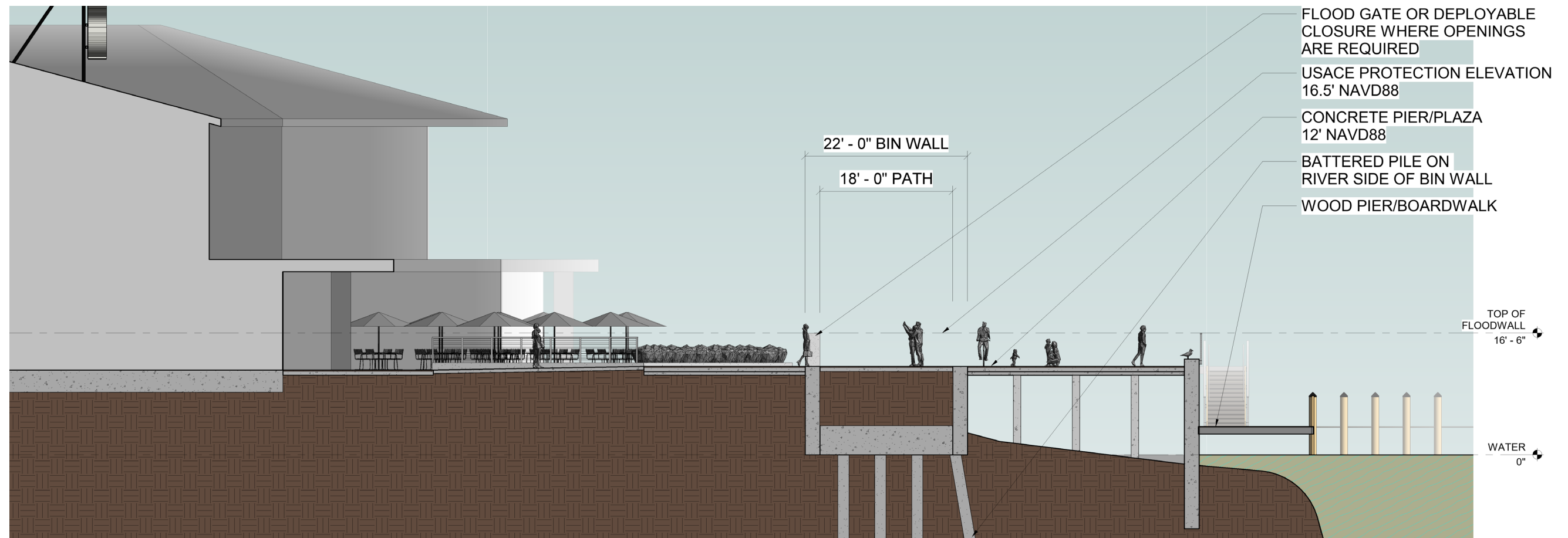
# WATERSIDE – RAISED PLAZA + BIN WALL



## EXISTING CONDITIONS



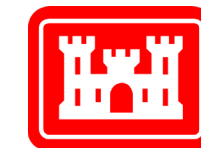
## PROPOSED DESIGN







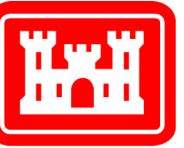
# TOWN POINT PARK LEVEE







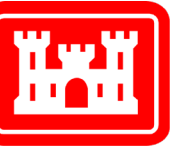
# FOUNTAIN PARK FLOOD WALL + PUMP STATION







# WATERSIDE – RAISED PLAZA + BIN WALL

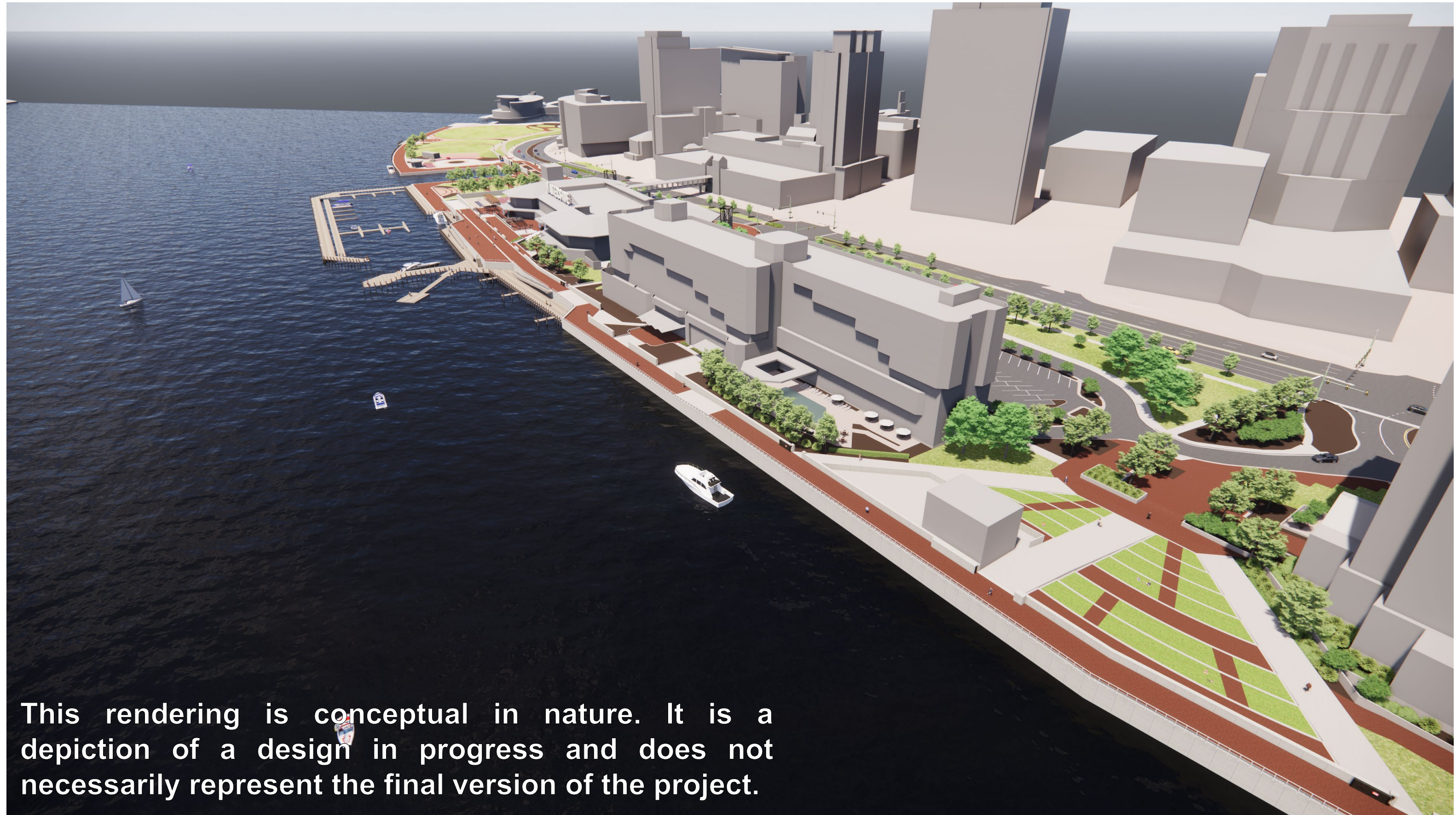
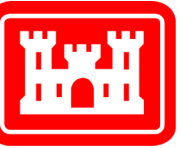


This rendering is conceptual in nature. It is a depiction of a design in progress and does not necessarily represent the final version of the project.





# WATERFRONT – BIN WALL + PUMP STATION

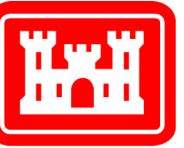


This rendering is conceptual in nature. It is a depiction of a design in progress and does not necessarily represent the final version of the project.





# DOMINION TOWER / SHERATON PLAZA PUMP STATION

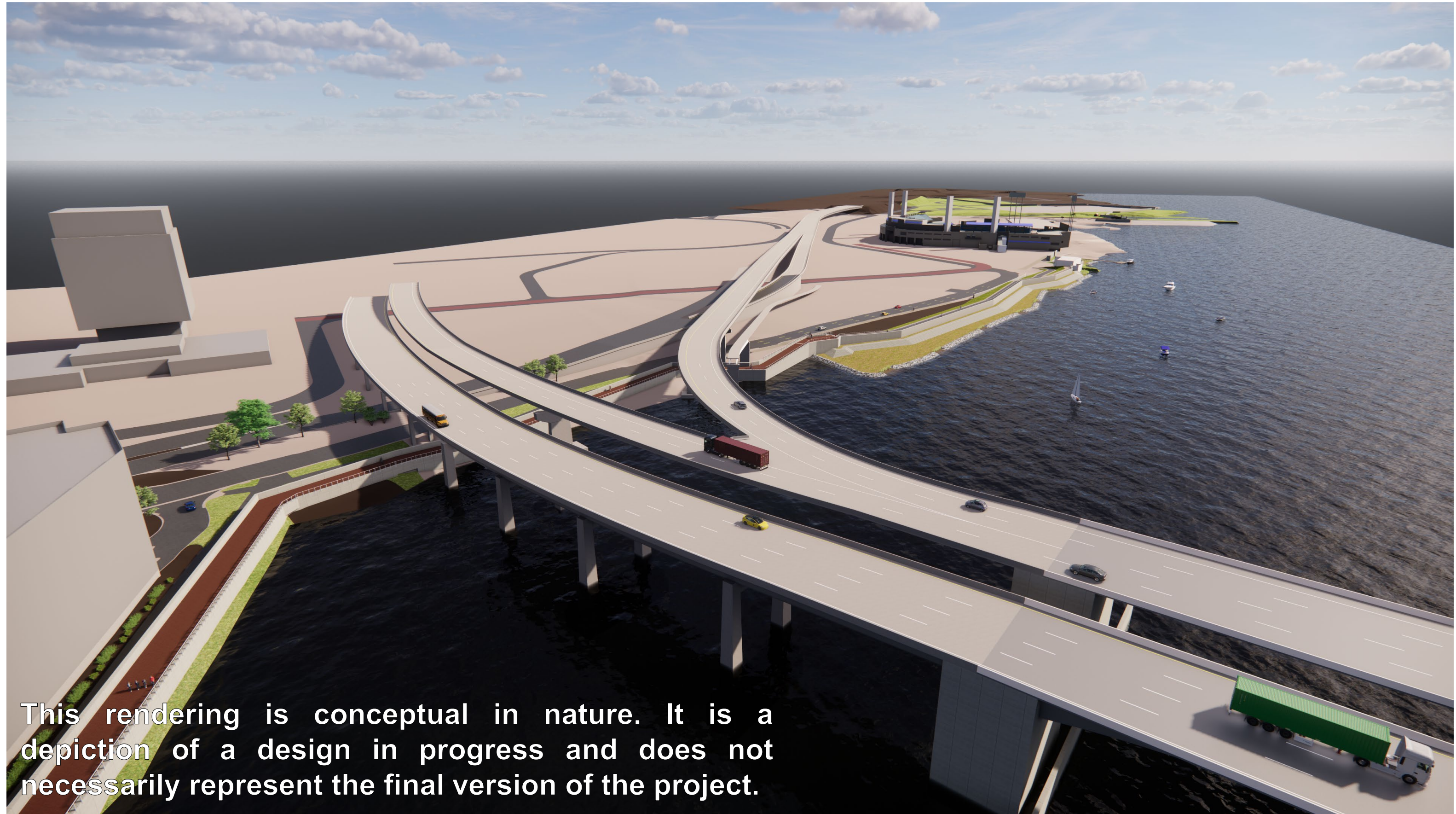
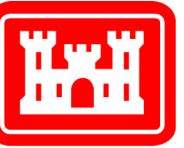


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# BERKLEY BRIDGE – HARBOR PARK LEVEE

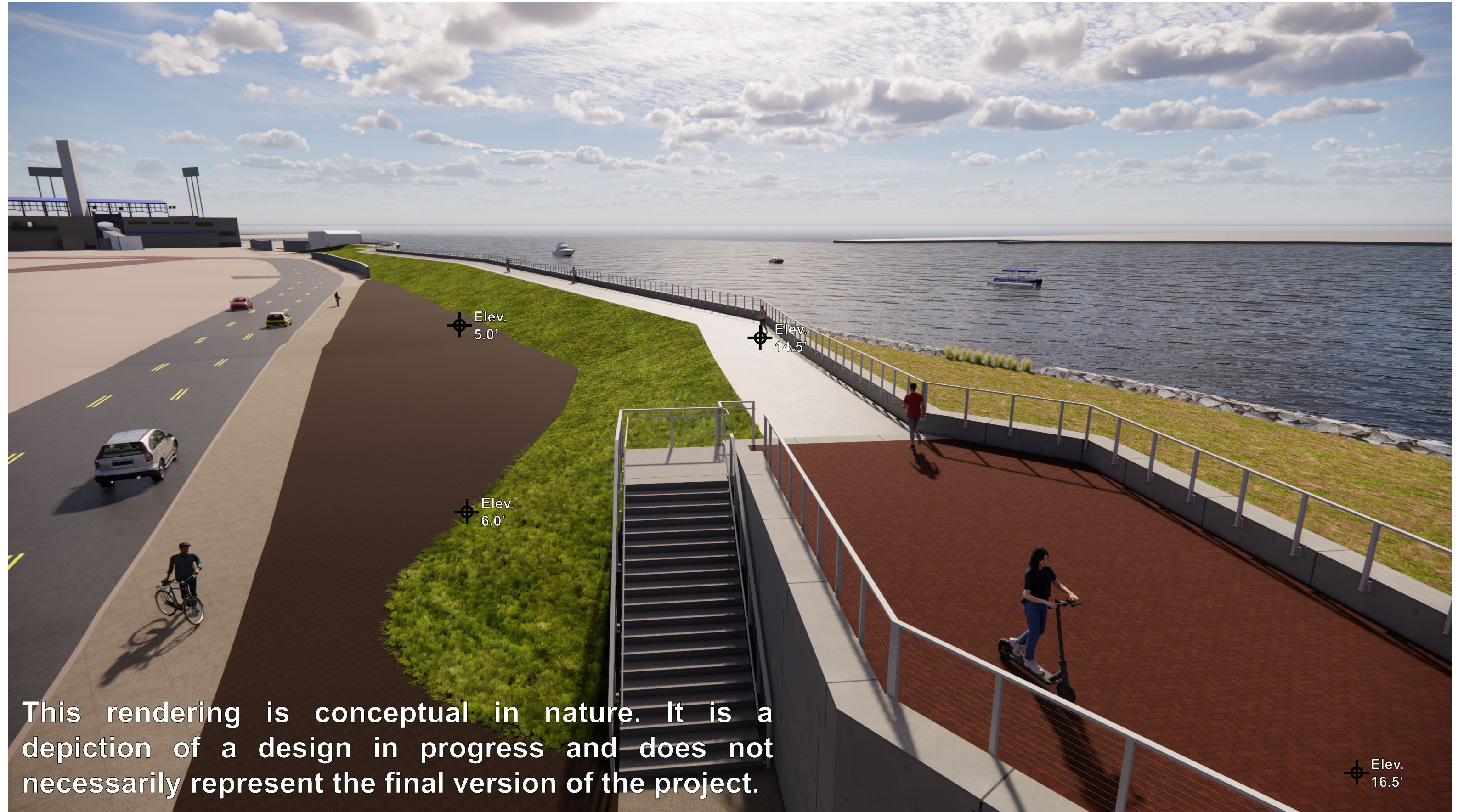
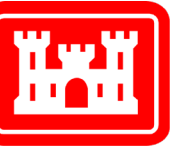


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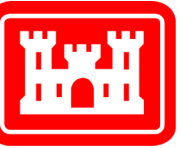
# BERKLEY BRIDGE – HARBOR PARK LEVEE







# ONGOING EFFORTS AND NEXT STEPS



- Complete the ongoing design of Phase 1A
- Complete design of remaining phases to include non-structural pilot program
- Identify Funding Allocation Plan over the 10-year schedule
- USACE and City finalizing Joint Communication Plan
  - Website: [www.ResilientNorfolk.com](http://www.ResilientNorfolk.com)
  - Continue Public Meetings
- City Council Ordinance to adopt Project Partnership Agreement