



Waterfront Flood Mitigation Implementation Update

October 23, 2018

Implementation underway or completed to date

- Information gathering
 - Archaeology and history documentary study
 - Surveys and geotechnical study
 - Environmental permitting studies
- Permit coordination and application preparation
- Flood mitigation system analysis
- Storm sewer system design
- Utility relocation design
- Overhead electric relocation design
- Pump station design
- Bulkhead and shoreline design

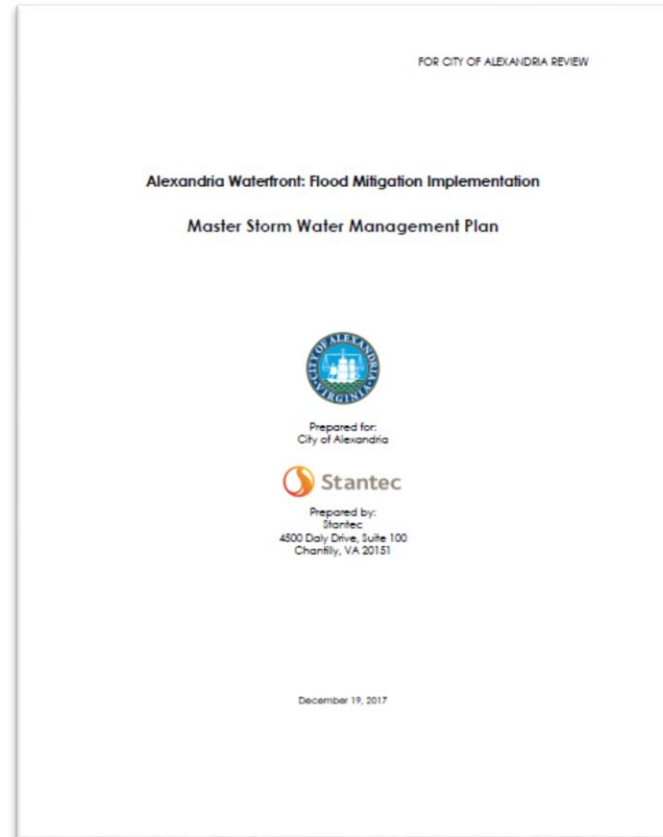
Flood mitigation system analysis

Storm Water Management Plan

- System-wide analysis of rainfall, pipes, and pump stations.
- Identifies infrastructure sizing, layout, and preliminary equipment at each pump station site.
- Developed in coordination with Olin to integrate seamlessly with park design.

Master Utility Plan

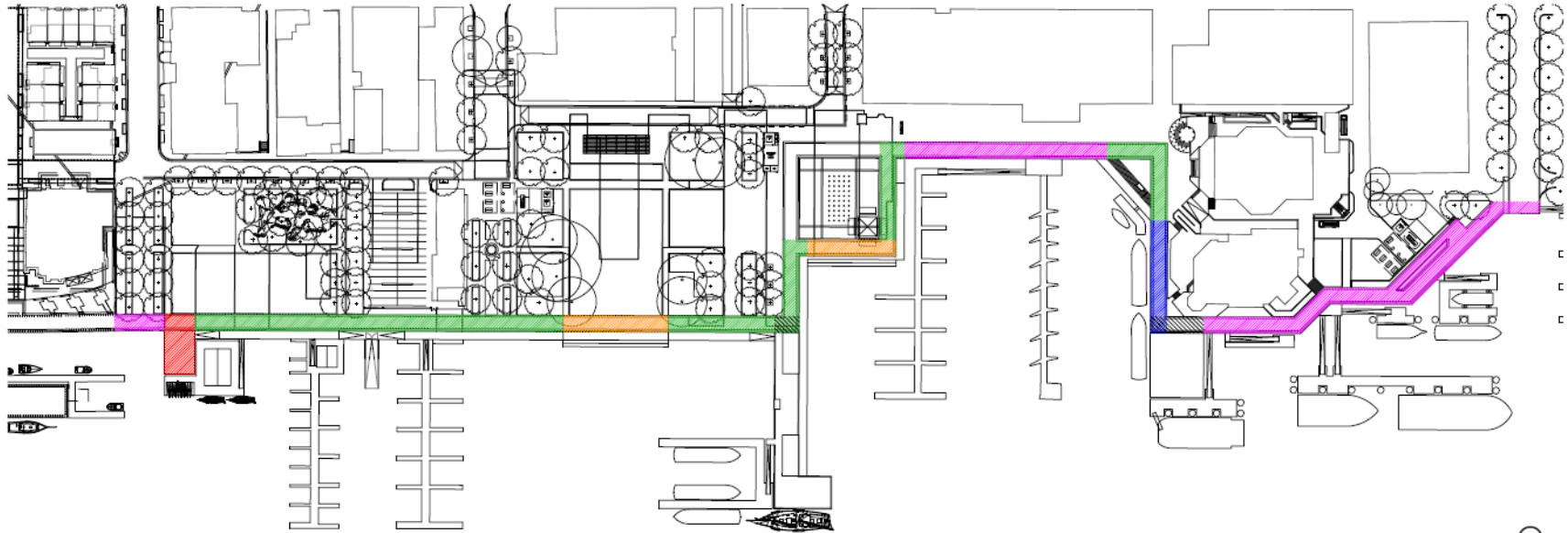
- Comprehensive study of existing and proposed utility conflicts.
- Preliminary relocation plan developed.
- Coordination with all affected utility companies.



Permitting agency coordination

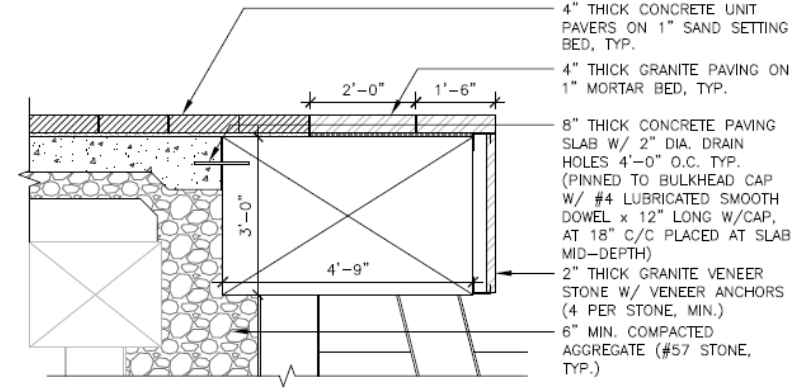
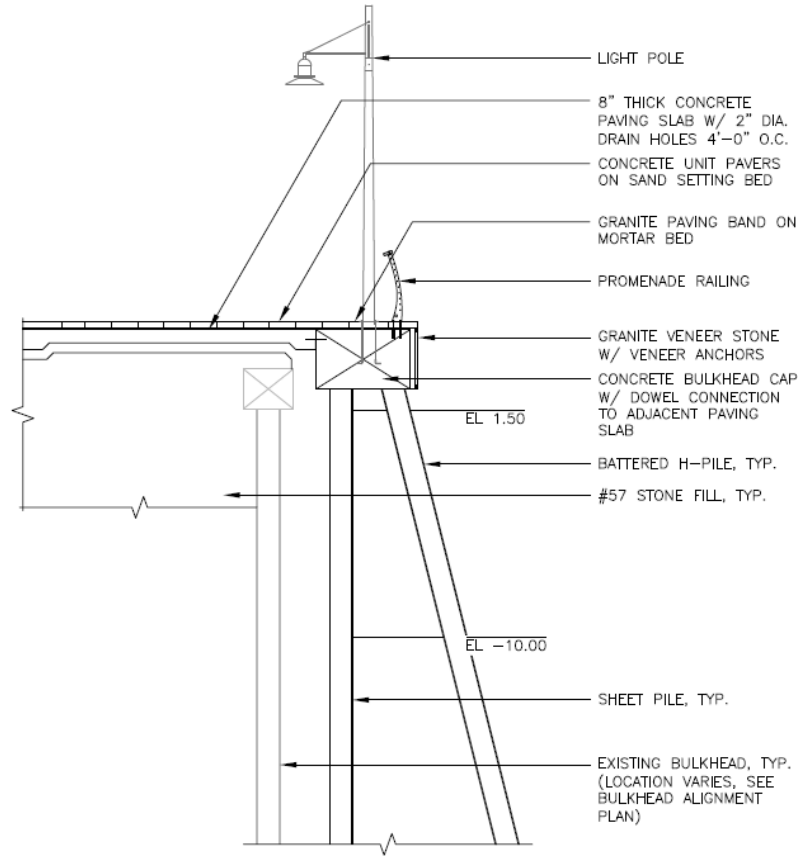
- U.S. Army Corps of Engineers (USACE)
 - Baltimore and Norfolk districts
- National Park Service
- NOAA - National Marine Fisheries Service
- U.S. Fish and Wildlife Service
- U.S. Coast Guard
- Virginia Marina Resources Commission (VMRC)
- Virginia Department of Environmental Quality (VDEQ)
- Virginia Department of Historic Resources (VDHR)
- Virginia Department of Conservation and Recreation/Natural Heritage
- Virginia Department of Game and Inland Fisheries
- District Department of the Environment (DDOE)

BULKHEAD CONSTRUCTION SECTIONS - KEY PLAN

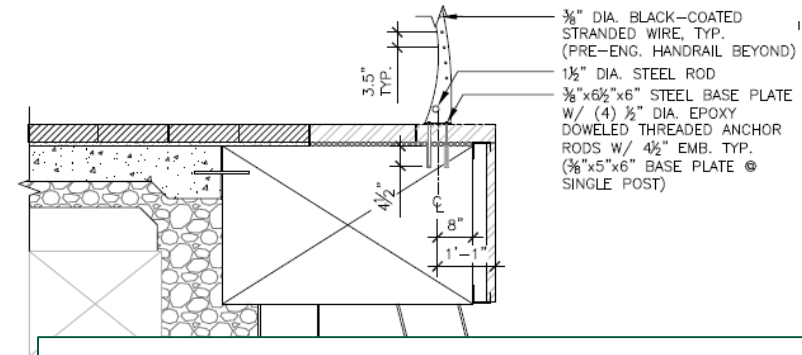


- A - PROMENADE WITH UNIT PAVERS
- B - PROMENADE ON ACTIVE / WORKING WATERFRONT
- C - PROMENADE WITH WOOD DECKING
- D - PROMENADE WITH LOWER BOARDWALK

Bulkhead design study



Pavement Attachment



Rail

Bulkhead design details

Schedule milestones

Next steps:

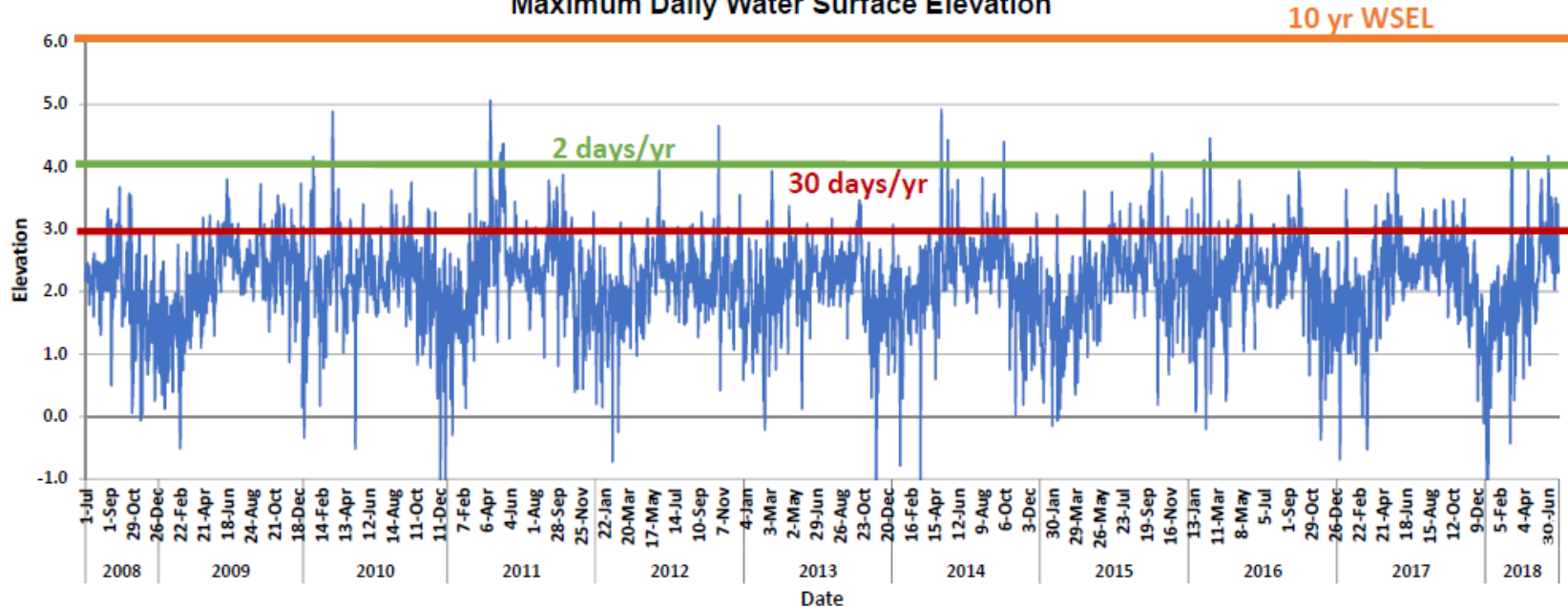
- Cost verification – 2018
- Community process for design elements – spring 2019
- Develop procurement plan – spring 2019
- Permit application to USACE – spring 2019
- Construction of early utility relocations – summer 2019

Funding:

- \$65 million included in CIP starting FY 2016
- Infrastructure funding budgeted through FY 2026

River elevations: 10 year summary

USGS River Elevation
 July 2008 - June 2018
 Maximum Daily Water Surface Elevation



River elevations: March to October 2018

USGS River Elevation
March 2018 - Sept. 2018 (7- Months)
Maximum Daily Water Surface Elevation

