

A photograph of a flooded street in Annapolis. The water is dark and reflects the overcast sky. In the background, there are several buildings, including a large one with white siding and a smaller one with a blue roof. Utility poles with many wires are visible. Two orange traffic cones are in the foreground on the right. The text "City of Annapolis" and "City Dock Flood Mitigation" is overlaid in yellow.

City of Annapolis City Dock Flood Mitigation

Presentation for
City Council Work Session
April 19, 2018

Overview

- Project Objective
- Project Drainage Area
- Tidal Flooding
- Proposed Flood Mitigation Concept Design
- Funding and Schedule



Project Objective

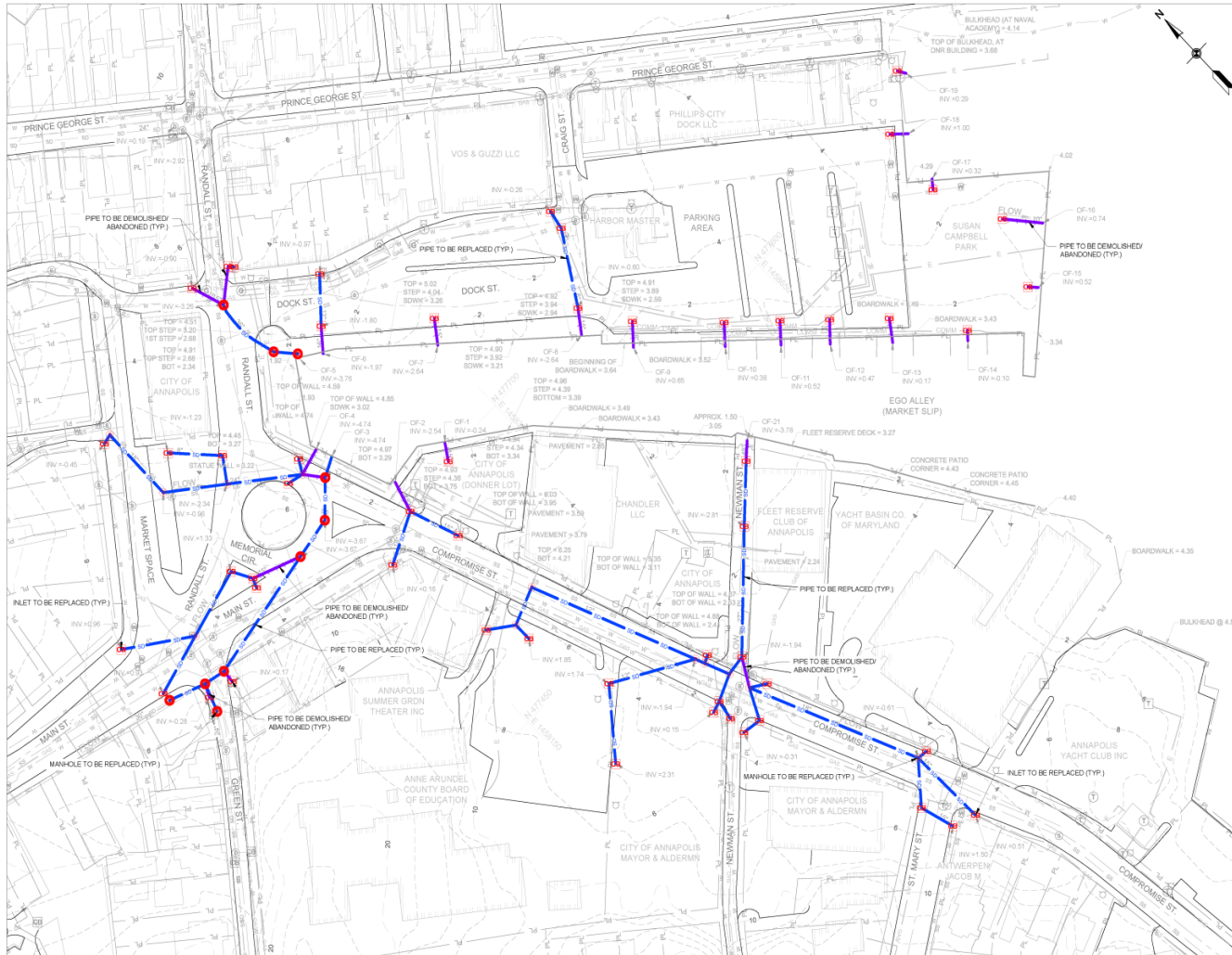
Reduce flooding at City Dock by eliminating the backflow of tidal water through the storm drain system and onto the adjacent streets.



Drainage System at City Dock



Existing Storm Drain System



GENERAL NOTES:

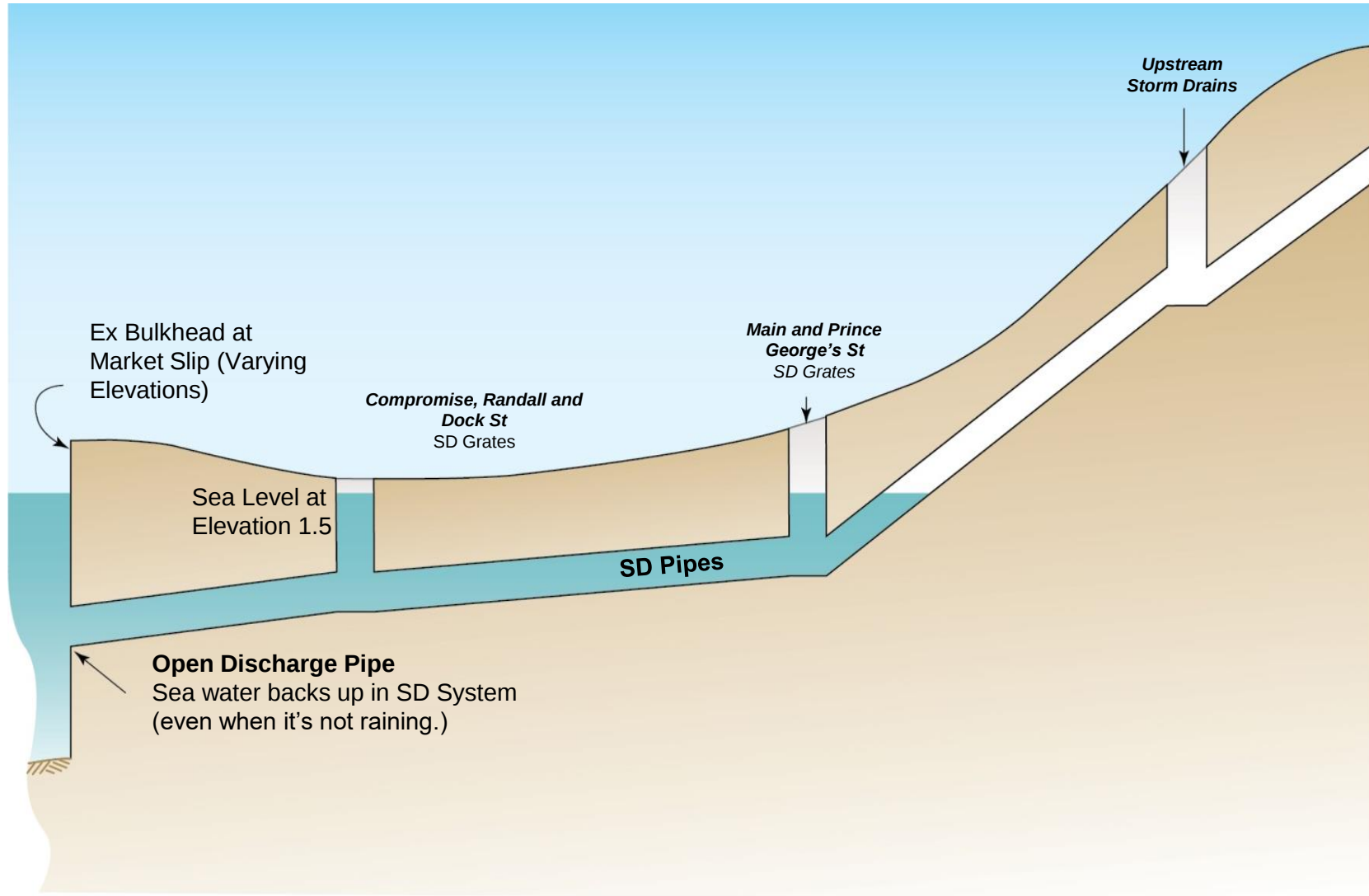
- EXISTING ABOVE GROUND STRUCTURES, ROADWAY ALIGNMENTS, STORM DRAIN LINES, SEWER LINES, WATER LINES AND TOPOGRAPHIC DATA ARE DERIVED FROM GIS DATA PROVIDED BY THE CITY OF ANNAPOLIS.
- LOCATIONS OF UNDERGROUND ELECTRIC LINES, OVERHEAD ELECTRIC LINES, POWER POLES, GAS LINE AND COMMUNICATION LINES ARE FOR INFORMATIONAL PURPOSES ONLY. PLEASE USE A LOCATING SERVICE FOR EXACT MARKINGS.

LEGEND:

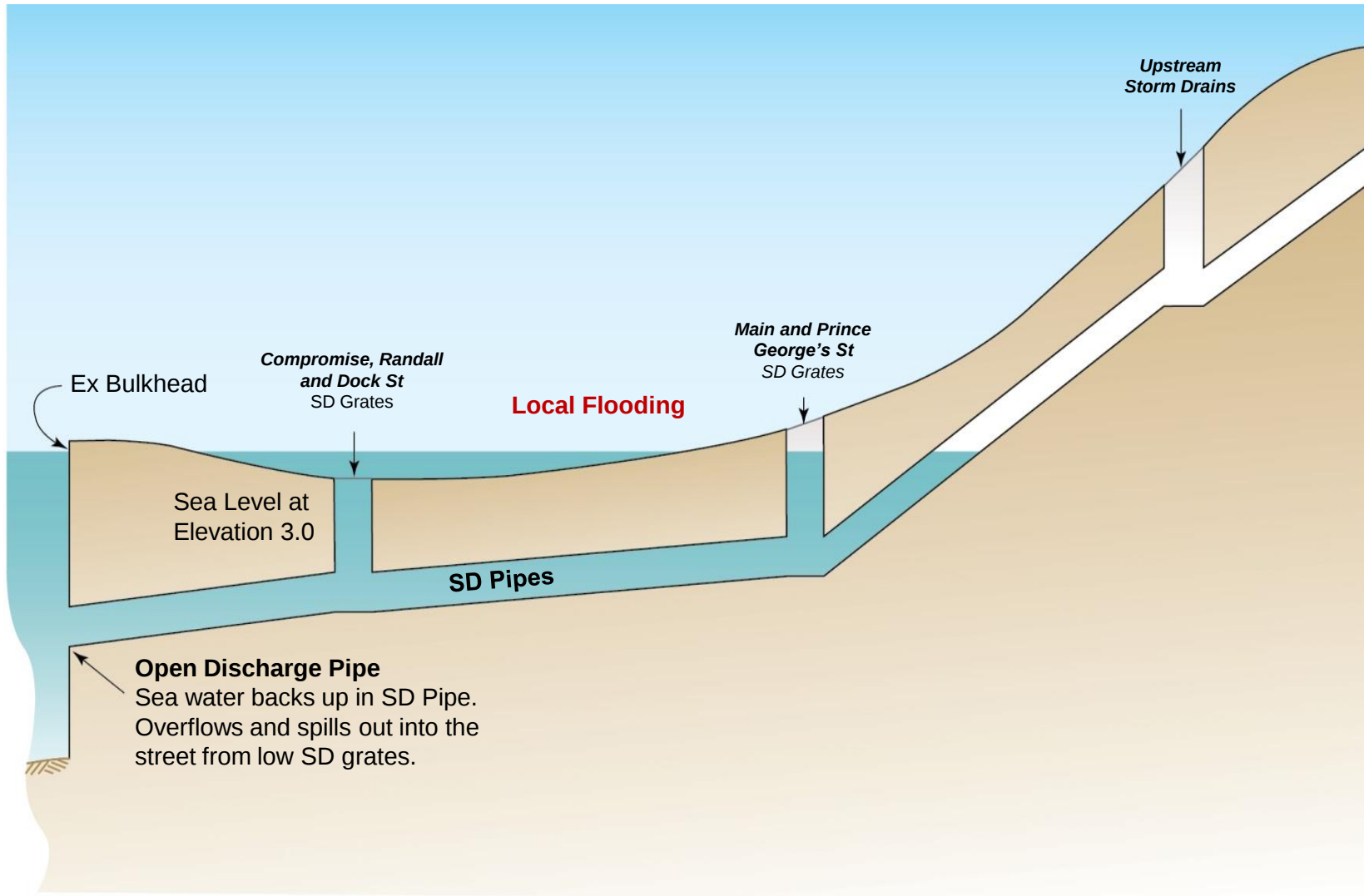
MAJOR CONTOUR	10
MINOR CONTOUR	4
PROPERTY LINE	PL
ROAD CENTERLINE	—
STORM DRAIN LINE	—
STORM DRAIN MANHOLE	⊙
STORM DRAIN INLET	⊠
SANITARY SEWER LINE	—
SANITARY SEWER MANHOLE	⊙
WATER LINE	—
WATER STRUCTURE	⊠
UNDERGROUND ELECTRIC LINE	—
TRANSFORMER (UGE LINE)	⊠
OVERHEAD ELECTRIC LINE	—
TRANSFORMER (OHE LINE)	⊠
GAS LINE	—
GAS STRUCTURE	⊠
COMMUNICATION LINE	—
POWER POLE	⊠
STORM DRAIN LINE TO BE ABANDONED/DEMOLISHED	—
STORM DRAIN LINE TO BE REPLACED	—
STORM DRAIN INLET TO BE REPLACED	⊠
STORM DRAIN MANHOLE TO BE REPLACED	⊙



Existing Storm Drain System During High Tide



Existing Storm Drain System During Extreme High Tide



Mean of All High Tides (2016) = 0.8 feet NAVD88



Flooding Through Storm Drains = 1.9 feet NAVD88



Extreme High Tide (March 7, 2018) = 2.7 feet NAVD88



Ten Year High Tide Elevation = 3.7 feet NAVD88



Base Flood Elevation (100-Yr) = 5.0 feet NAVD88



Hurricane Isabel (September 2003) = 6.4 feet NAVD88

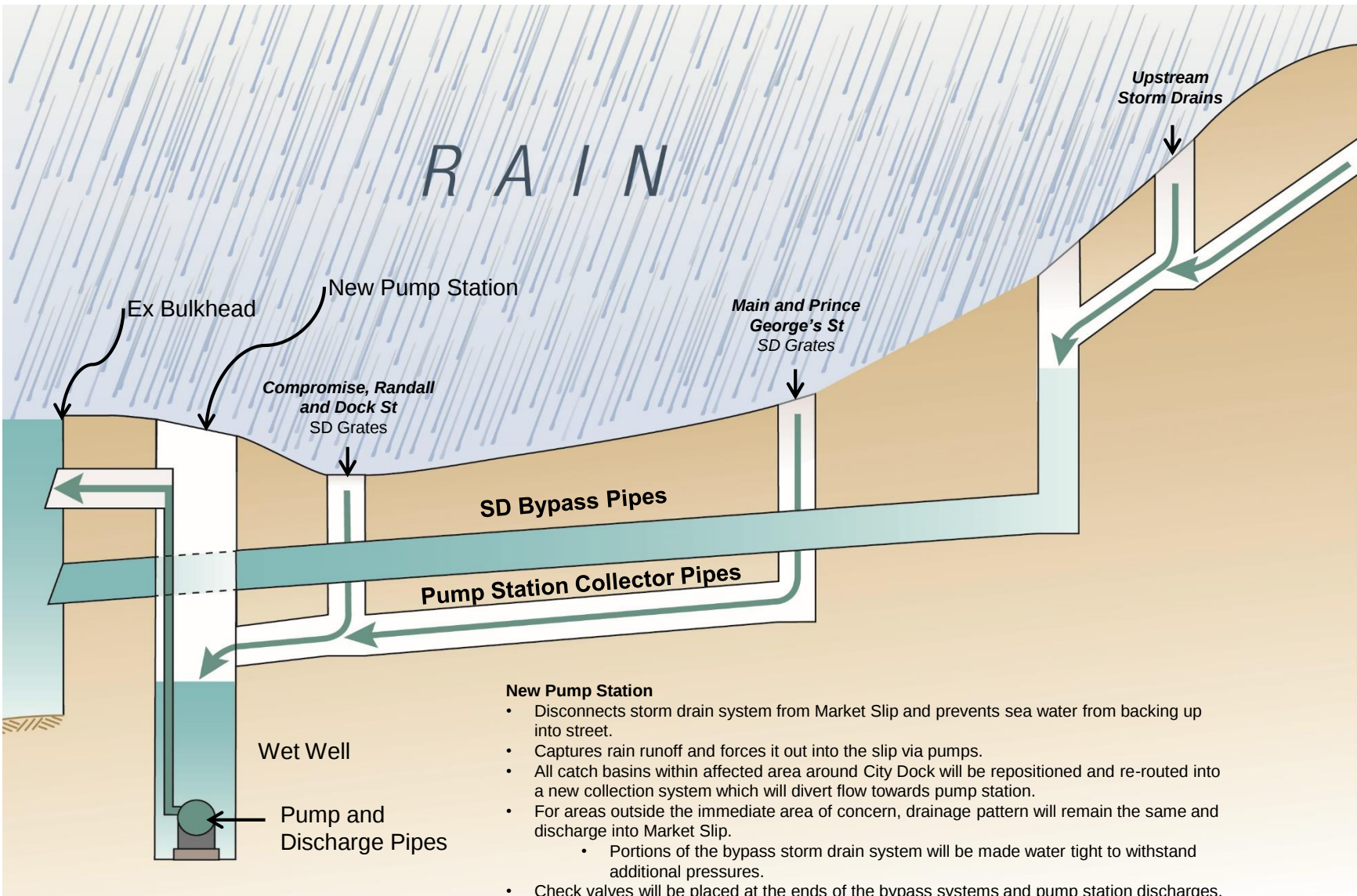


Features of Proposed Flood Mitigation System

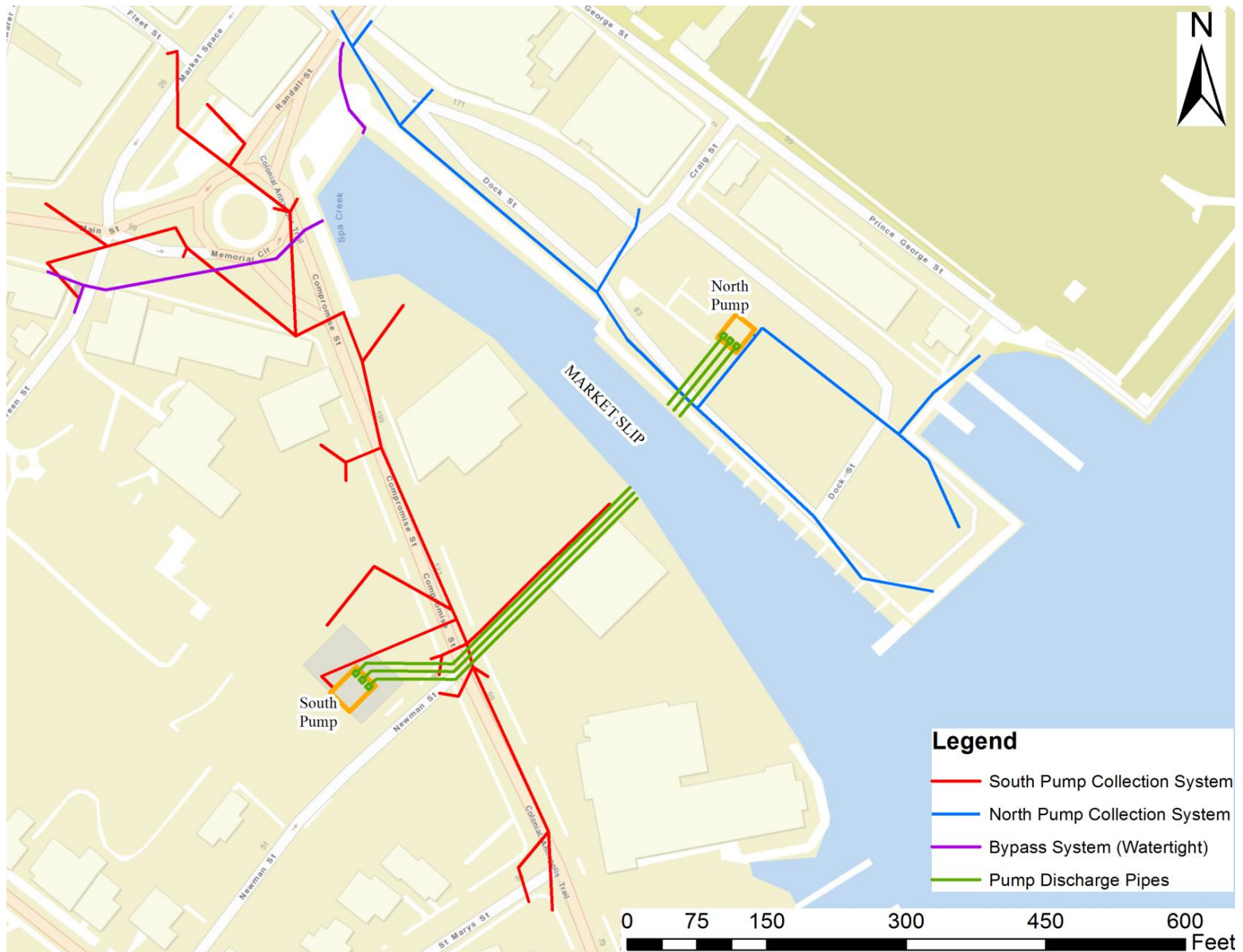
- Storm Drain Improvements
 - Bypass system
 - Localized system
- Control Building (1)
- Wetwell and Pump Locations (2)
- Grading Modifications
 - HC ramp modifications adjacent to Alex Haley Statue
 - Raise Newman St. seawall



Proposed Solution Schematic



Proposed Storm Drain Improvements



Proposed Area Serviced by Pump Stations



Typical Pump Station Schematic

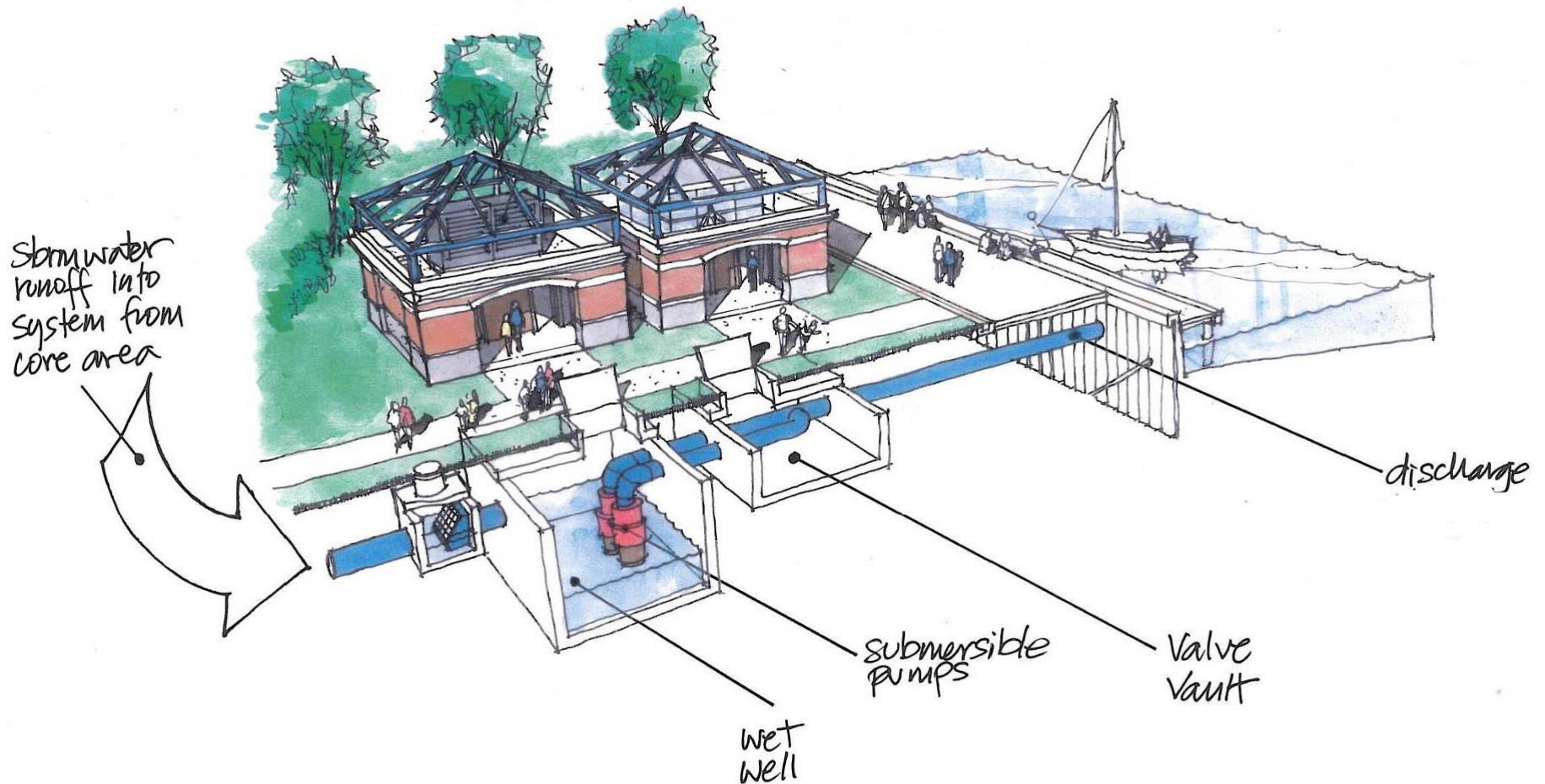


Image Source: Olin Studios for City of Alexandria Waterfront Small Area Study

Filtration of Storm Water at Pump Stations

- Two critical questions regarding the addition of filtration:
 - Is filtration required by law or regulations? NO
 - Is filtration recommended to meet the anticipated requirements of the City's MS4 permit expected to be issued in the near future? NO
- AECOM prepared the City's watershed management plan. AECOM is the design engineer for the flood mitigation project.
- The WMP identified 16 projects ("low hanging fruit") to most cost effectively meet the MS4 permit's requirement to treat 20% of the city's untreated impervious surface
- Filtration of the storm water at City Dock is not the most cost effective way to meet the MS4 permit requirements
- Filtration may be added in the future if additional MS4 requirements are imposed

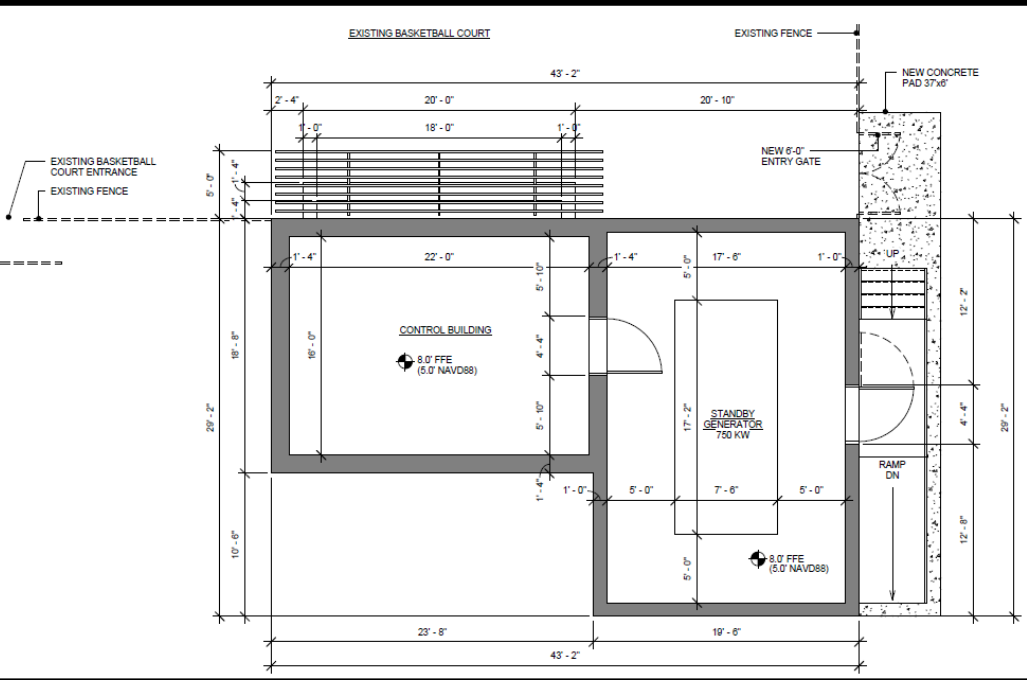
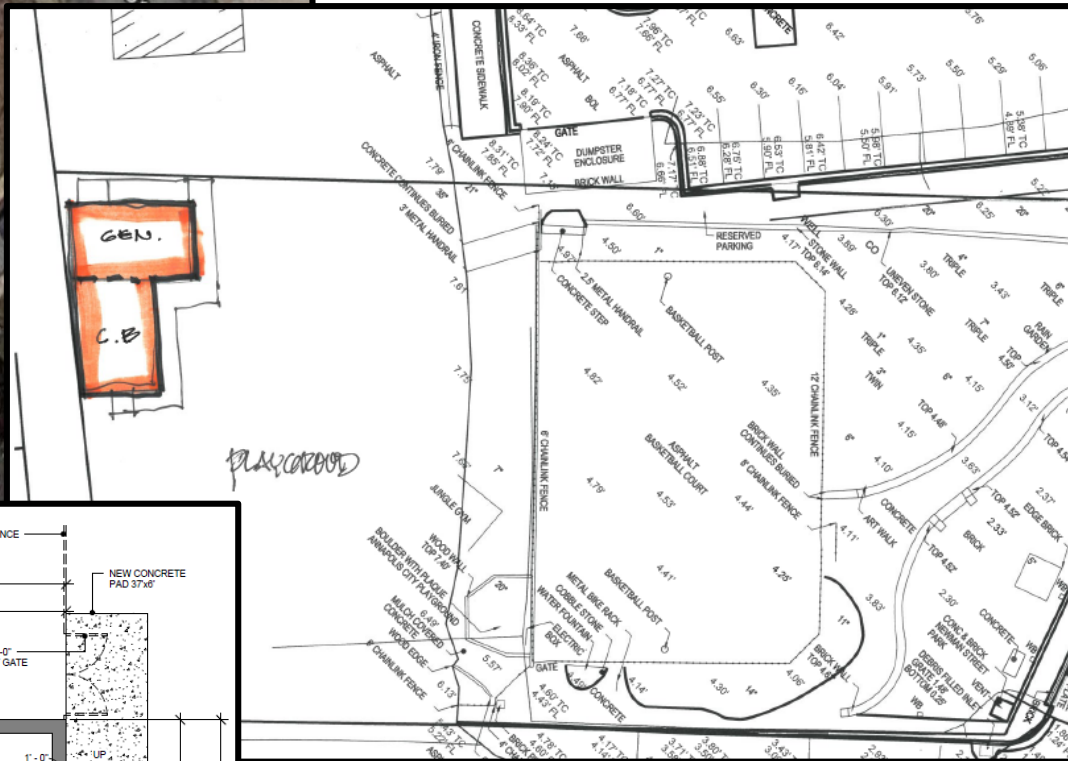


Pump Station Control Building

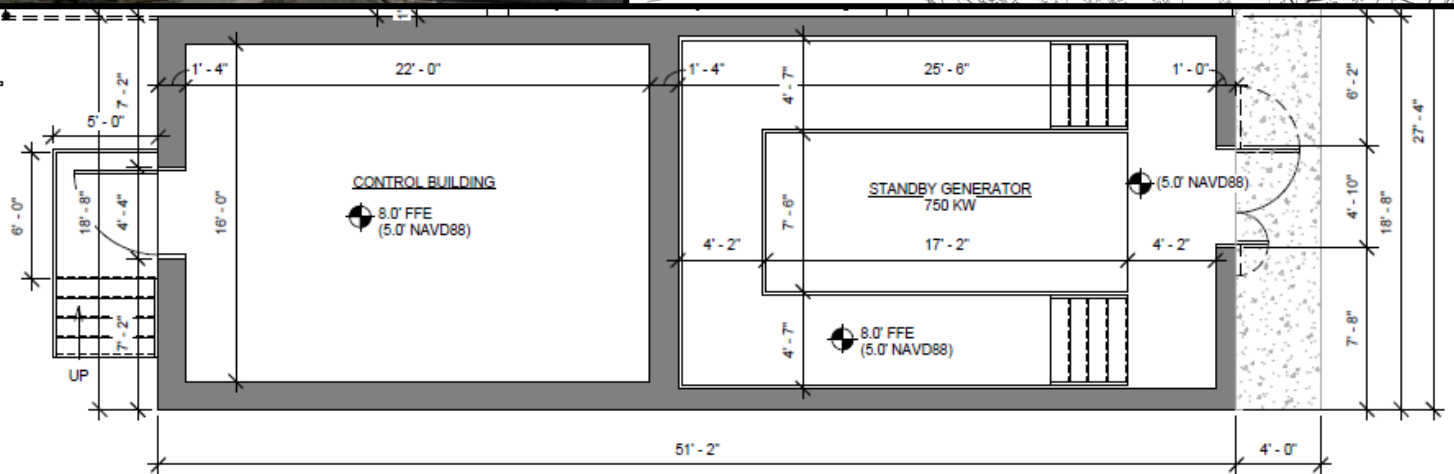
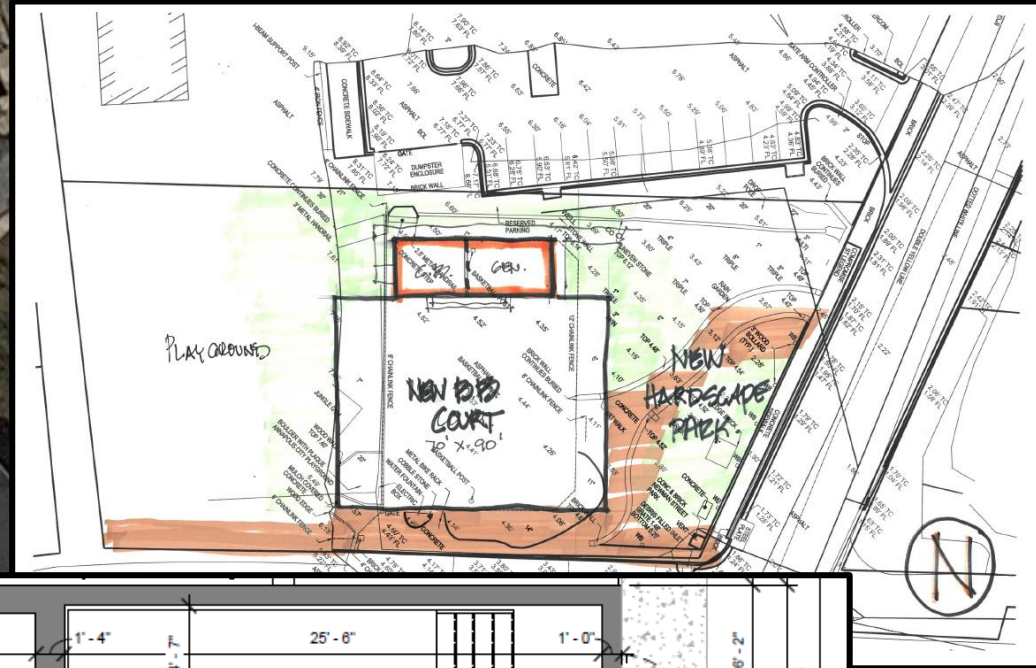
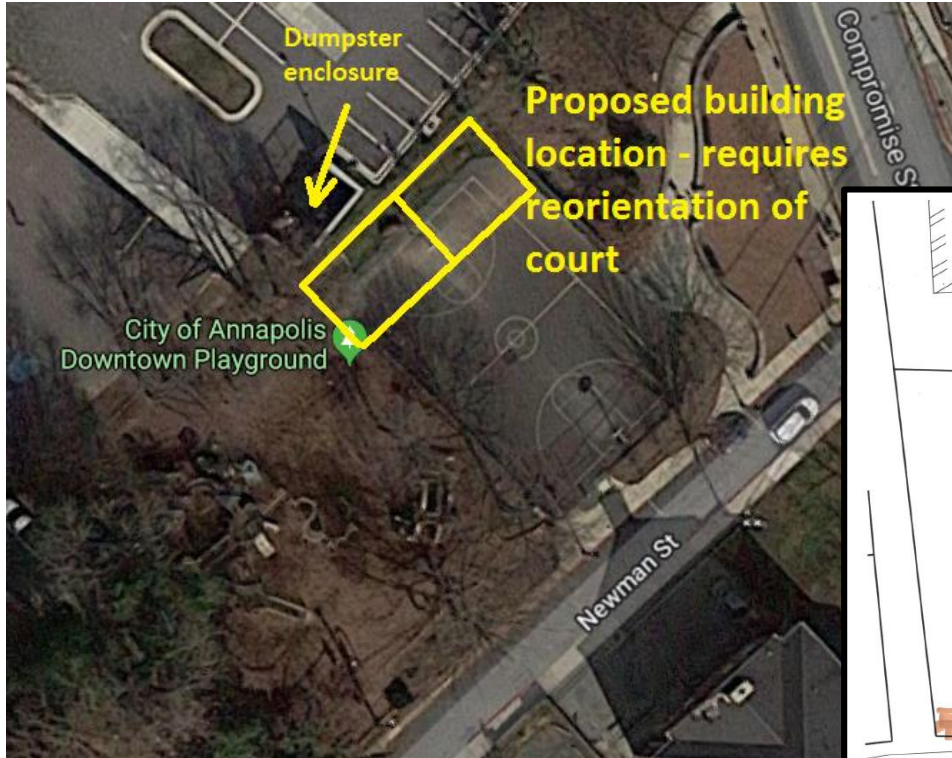
- 14 alternative site locations were considered at Newman Park
 - The Newman St. parking lot was considered but not selected due to impact on waterfront viewshed and Boat Show plans for main entrance at that location. HPC input was that they would not approve that location for the pump control building.
 - Proposed hotel on Dock St. was considered but not selected due to uncertainty surrounding the project and its schedule.
- Many alternative building configurations were evaluated, using a building block approach
- HPC pre-application hearing on Tuesday, April 10. HPC members unanimously recommended two site locations and building configurations as the best alternatives.
- Continue receiving public input until the end of April
- Workshops will be held to discuss input received



Pump Station Control Building – Option 1



Pump Station Control Building – Option 2



Grading Modifications



Goal: Provide consistent level of protection around Market Slip up to elevation 3.2 feet.

Dinghy Dock

- Handicap ramp to be reconstructed 3 inches higher while maintaining ADA accessibility.
- Flooding from high tide contained within brick plaza.

Newman Street

- Raise approximately 100 feet of existing concrete wall from 1.5 feet to 3.2 feet.



Flood Protection Achieved: 3.2 feet NAVD88



Project funding

- Design of Phase 1: \$1 million (State funded)
- Phase 1: Compromise Street (south) side of City Dock
 - FEMA Grant - \$3 million
 - City Contribution - \$1.5 million
 - Funding from State - \$2 million
 - **TOTAL COST - \$6.5 million (FY 2019 funding)**
- Phase 2: Dock Street (north) side of City Dock
 - City Contribution - \$1 million
 - Request from FEMA/State - \$3 million
 - **TOTAL COST - \$4 million (FY 2020 funding)**



Project timeline

- Public Input – on-going through April 2018
- Initiate Design Development – December 2017
- Approval of FEMA grant application – June 2018
- Complete Ph. 1 Design Documents – December 2018
- Construction Bidding – Early 2019
- Phase 1 Construction Start – May 2019
- Phase 1 Construction Completion – Fall 2020
- Phase 2 Construction Start – TBD
- Phase 2 Construction Completion – TBD



Questions?



AECOM Concept Design Report

