Ohio Creek Watershed Project
Environmental Impact Statement

THE CITY OF NORFOLK

WELCOME

VIRGINIA DHCD

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ARCADIS

WAGGONNER & BALL

SCAPE

Purpose and Need

The purpose of the project is to:

- Design a coastal community capable of resisting the increased risk of flooding
- Support economic opportunity by advancing efforts to improve existing industry operations
- Advance initiatives to connect communities, deconcentrate poverty, and strengthen neighborhoods

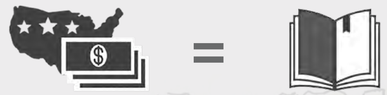
These factors undermine the City's Resilience and drive the need for the project:

- The impact of increased flooding and increased threat from coastal storms
- The lack of economic vitality
- The concentration of poverty

Additional Objectives

- Identify urban opportunities
- Improve access conditions
- Incorporate landscape and community amenities into the project design

Why Write an Environmental Impact Statement?



An environmental impact statement (EIS) is being prepared in accordance with the National Environmental Policy Act (NEPA). NEPA was established to assure that impacts to the natural, cultural, and human environment that may take place as the result of a major federal action are given proper consideration. Because the proposed improvements are funded through a grant from the National Disaster Resilience Competition for the Ohio Creek Watershed Project, this project is considered a major federal action. Similar to NEPA, the impacts are also being considered under the National Historic Preservation Act.

How to Comment

We look forward to hearing your thoughts on the materials presented. You may provide comments in the following ways:

Provide comment to:

Send an email to resiliency@dhcd.virginia.gov

Fill out a comment form and submit it in person at the open house.

Submit a written comment by mail at:

Virginia Department of Housing and Community Development
Attn: Traci Munyan, Resiliency Program Manager
600 East Main St, Suite 300
Richmond, VA 23219

Please submit comments by March 16, 2018

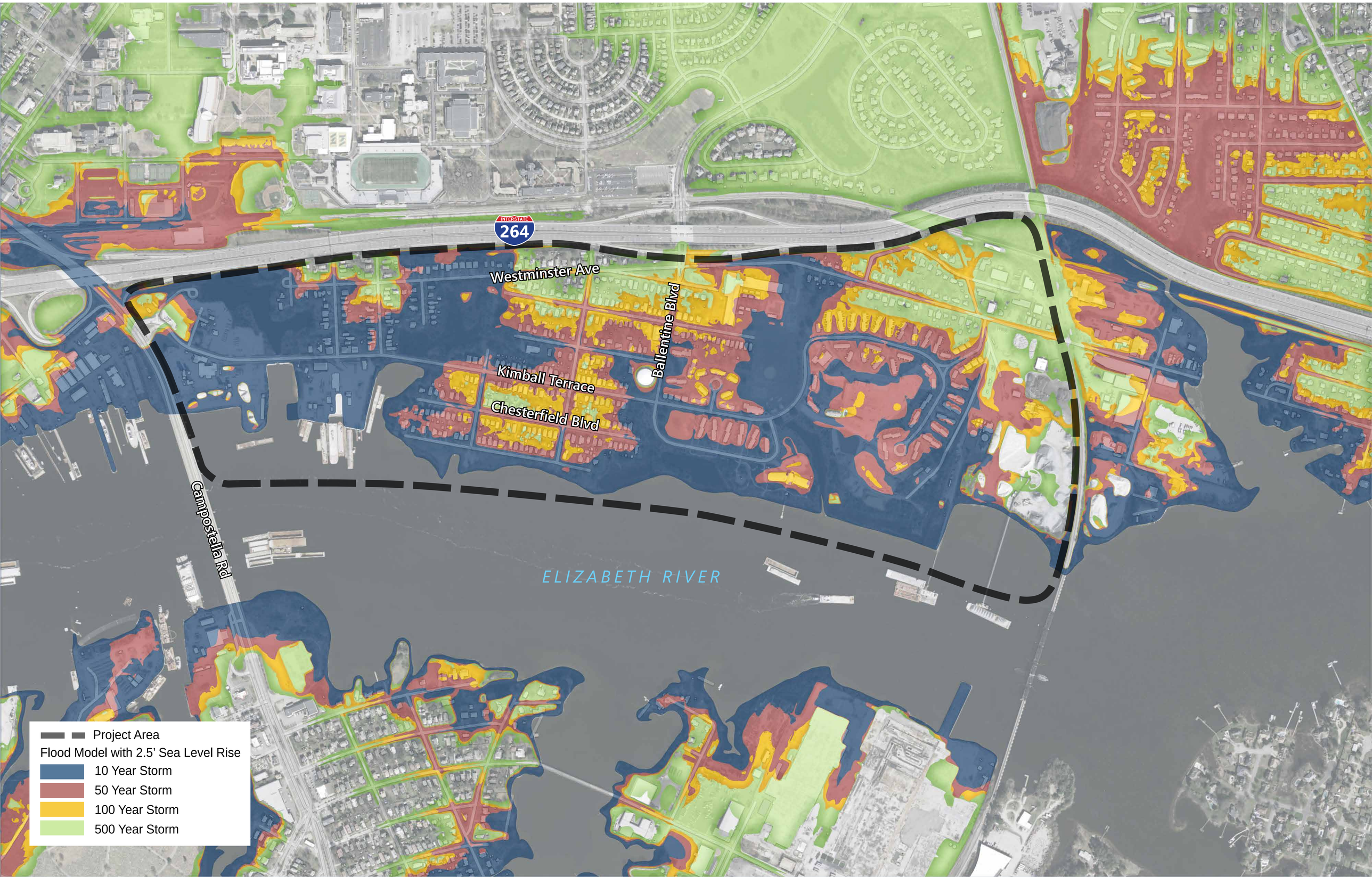
Planning Process and Schedule

The table below outlines the compliance process, highlighting where we are now and future opportunities for public input.

Timeframe	Project Milestones
Spring 2017	Grant awarded, Initial Planning and Design, Multiple Community Meetings*
Winter 2017-2018	Public and Agency Scoping Period* Public Scoping Meeting: Feb 21, 2018* **We are here**
Spring-Summer 2018	Prepare Environmental Impact Statement (EIS), Submit State & Federal Permit Applications
Fall 2018	Public Review of Draft EIS*
Winter 2018-2019	Final EIS Distributed
Spring 2019	Announcement of Decision, Request Release of Funding, State & Federal Permits Issued*
Summer 2019	Bid Package Awarded
Summer 2022	Construction Closeout

* Opportunities for public review and comment are hightlighted in orange.

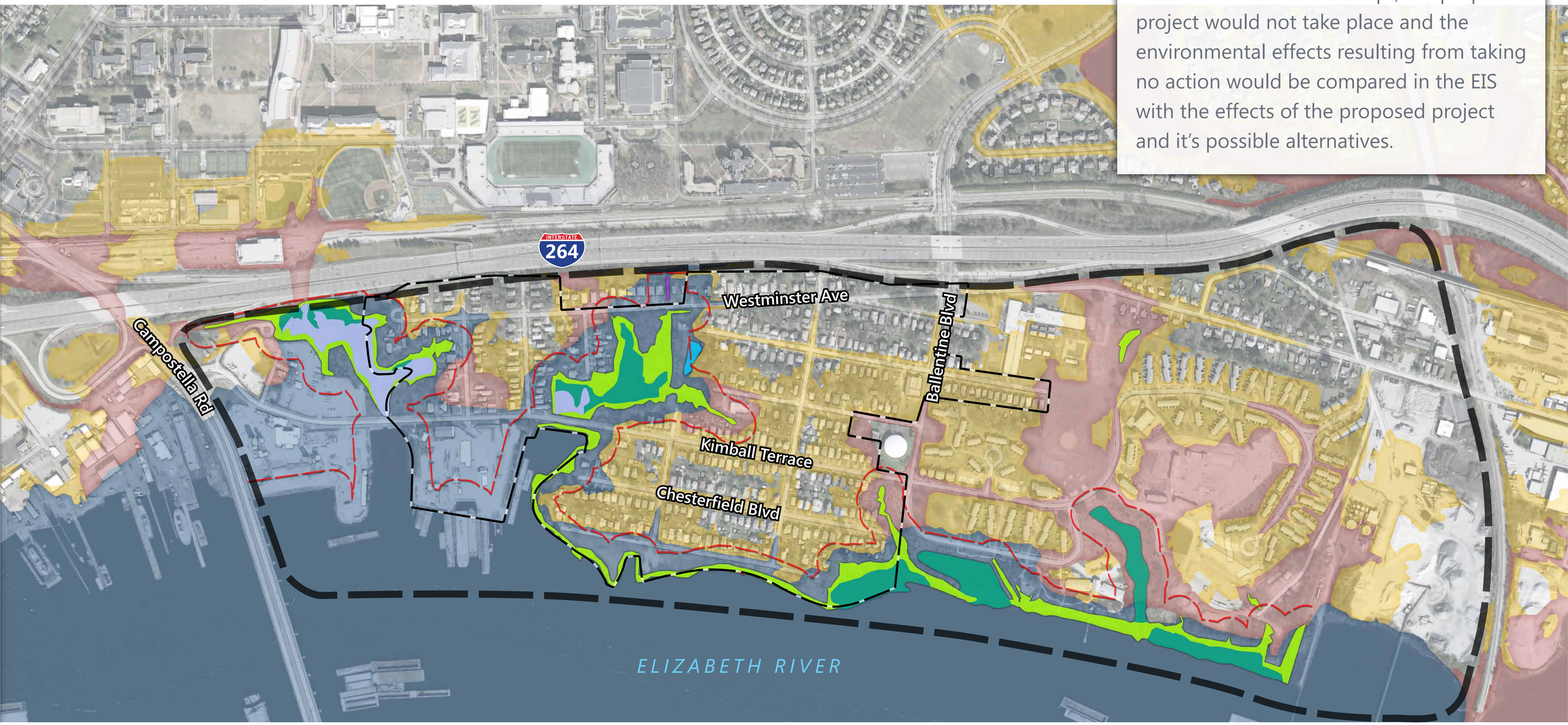
Future Flooding Potential



Existing Conditions (Concept 1 - No Action)

What is a "No-Action" Concept?

Under the no action concept, the proposed project would not take place and the environmental effects resulting from taking no action would be compared in the EIS with the effects of the proposed project and it's possible alternatives.



- Project Area
- Historic District Boundary

Wetlands and Other Waters of the U.S.

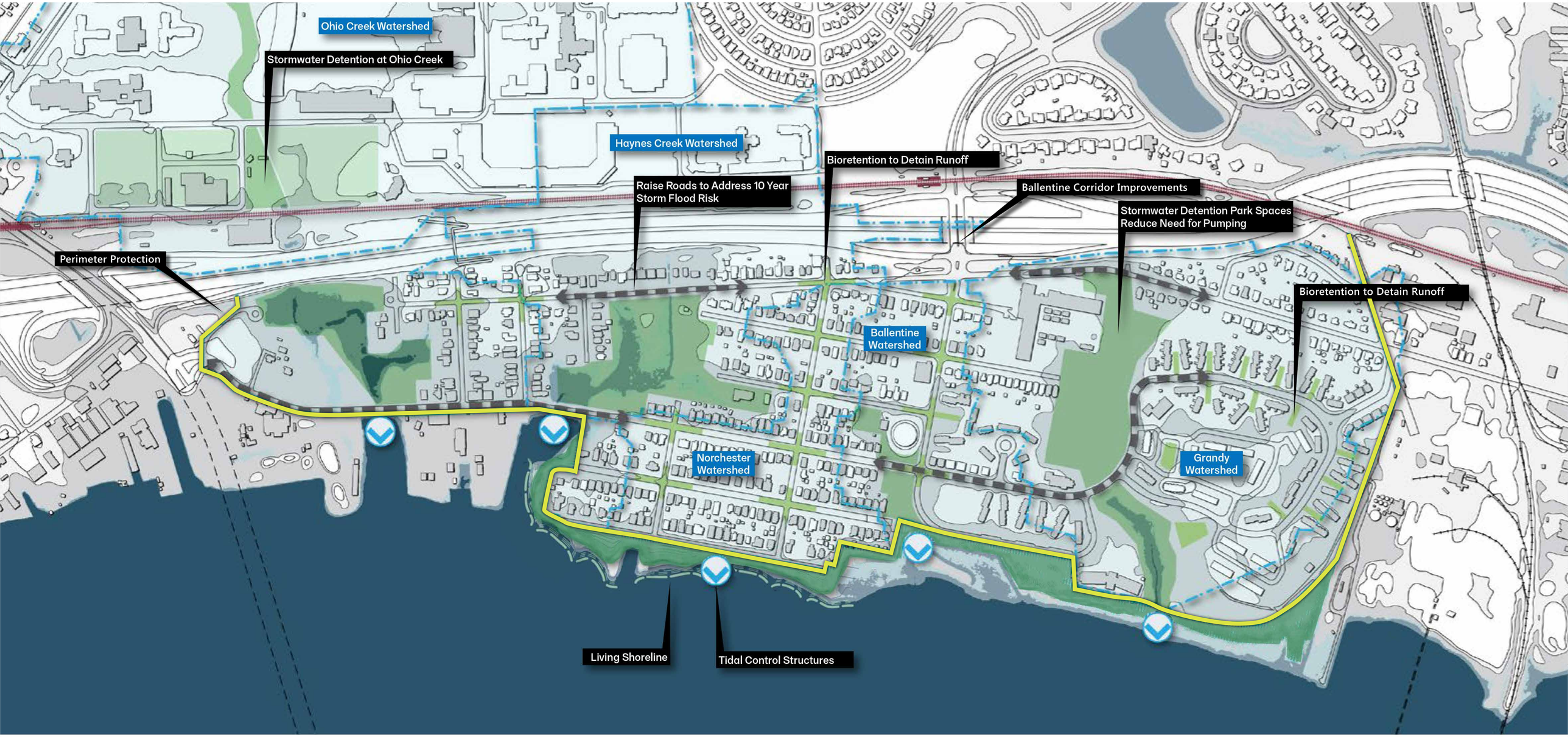
- Estuarine Wetlands
- Estuarine/Palustrine Wetlands
- Estuarine Unconsolidated Bottom
- Pond

FEMA Flood Zones

- Zone AE (Elev. 9 Ft.)
- Zone AE (Elev. 8 Ft.)
- Zone X - 0.2% chance of flood hazard
- Resource Protection Area (100 Ft. buffer)

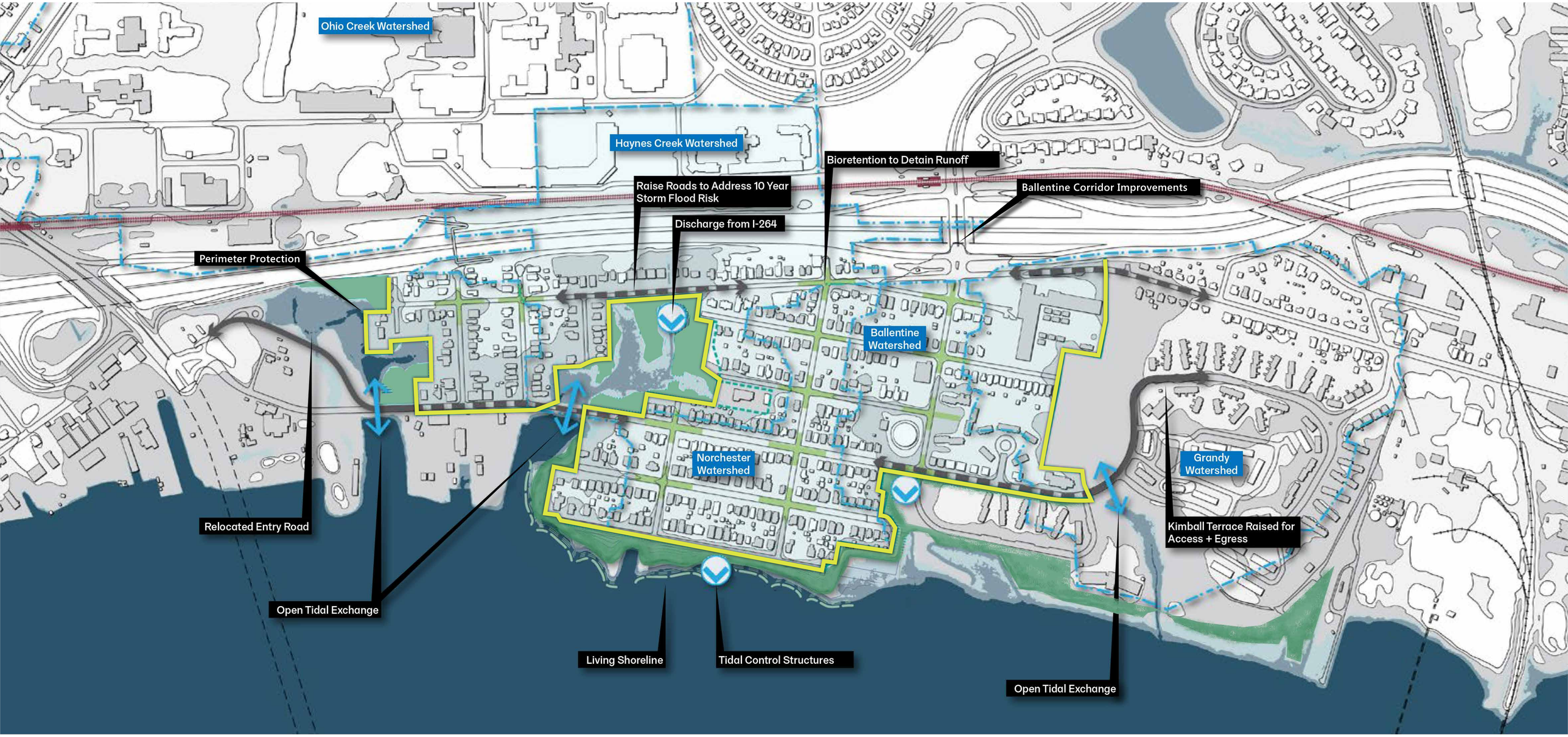
- No coastal defenses installed
- No comprehensive change in stormwater handling
- Communities (especially roadways) remain vulnerable to flooding

Concept 2



- Coastal defenses surround the greatest extent of the project area, including the historic district, Grandy Village Learning Center, Chesterfield Academy, and Grandy Village.
- Intensive use of pump stations (some fairly large), located at Ohio Creek, Haynes Creek, and Grandy Village.
- Requires incorporation of stormwater drainage and infrastructure improvements north of I-264 due to the tidal control structures on Ohio Creek.

Concept 3



- Coastal defenses surround the Historic District and Chesterfield Academy.
- Open tidal exchange at Ohio Creek, Haynes Creek, and Grandy Village. This provides less water storage capacity and increases the need for perimeter protection within the creeks.
- Fewer pump stations than the other concepts.

Concept 4

- Coastal defenses focus on the historic district and Chesterfield Academy.
- Open tidal exchange at Ohio Creek and Grandy Village. This reduces (but does not eliminate) need for pump stations.
- Stormwater storage within the project area is maximized.

Integrated Coastal Flood Protection Methods

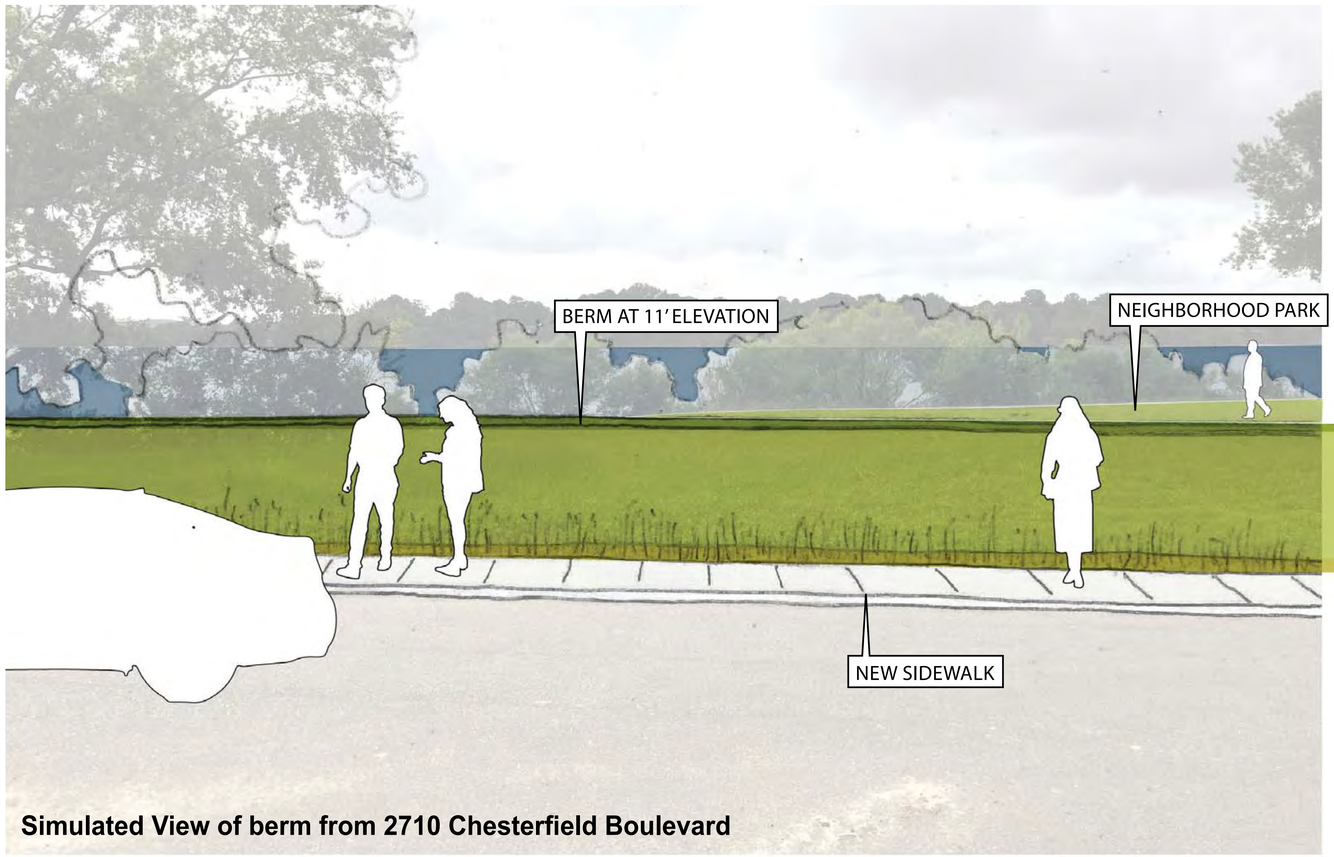
- Types of flood protection being considered to protect the project area: Floodwall, Berm, Raised Roads, Living Shoreline, and Tide Gates
- This graphic shows a sample arrangement of all five types.
- See other boards for more information on each type.

Integrated Coastal Flood Protection - Berm and Floodwall

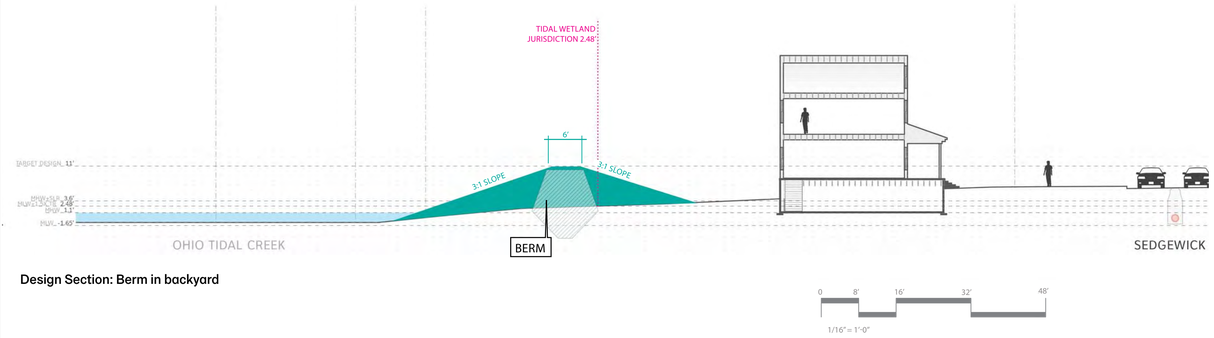
What is a Berm?

- A berm is a raised ridge or embankment, often manmade.
- Berms are often used to mitigate flooding and to manage stormwater flow.
- Berms are durable and can be integreated with the natural shoreline.

Existing Condition Photo



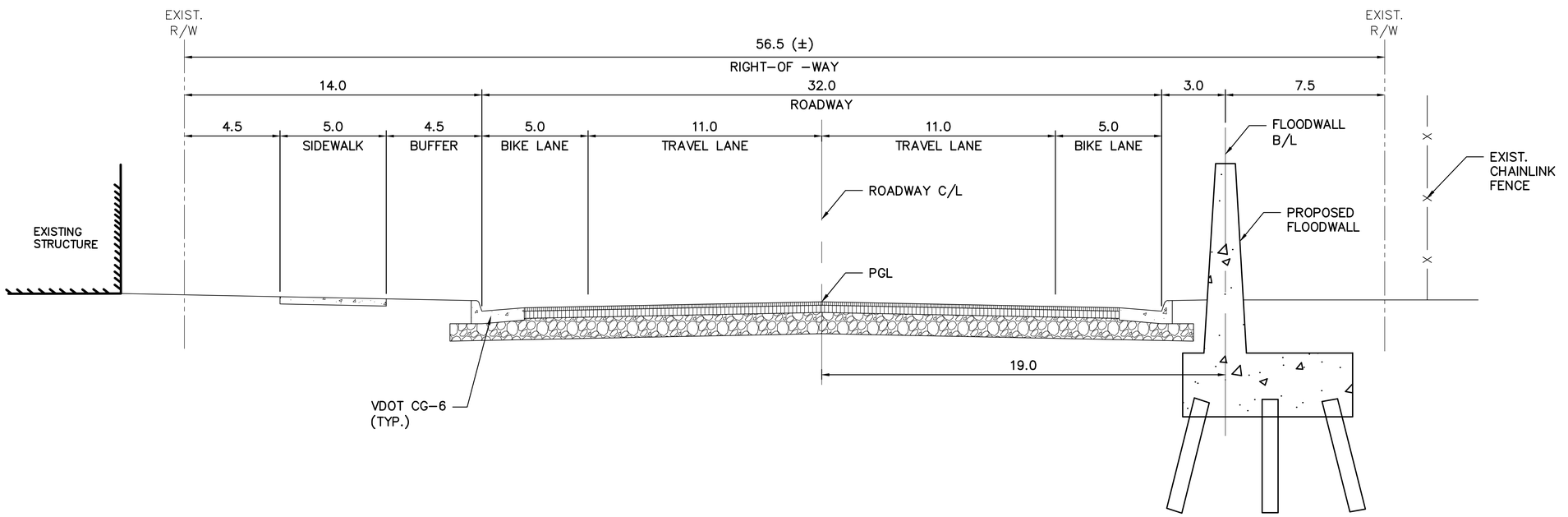
Simulated View of berm from 2710 Chesterfield Boulevard



Design Section: Berm in backyard

What is a Floodwall?

- A floodwall is a vertical barrier designed to temporarily contain the waters of a river (or other waterway) which may rise due to extreme weather events.
- Floodwalls can be installed within minimal footprints.
- Careful design and installation is essential to the durability of floodwalls.



Integrated Coastal Flood Protection - Living Shoreline

What is a Living Shoreline?

- Living shorelines incorporate manmade elements such as stone sills to protect and encourage natural beaches and wetlands.
- Living shorelines often provide many of the same functions as a natural shoreline, creating habitat and improving ecological functions where they are used.
- For this project, living shorelines also provide erosion protection for other flood defense structures and will be incorporated as appropriate throughout the project area.

Existing Chesterfield sandy shoreline and shellfish at low tide.

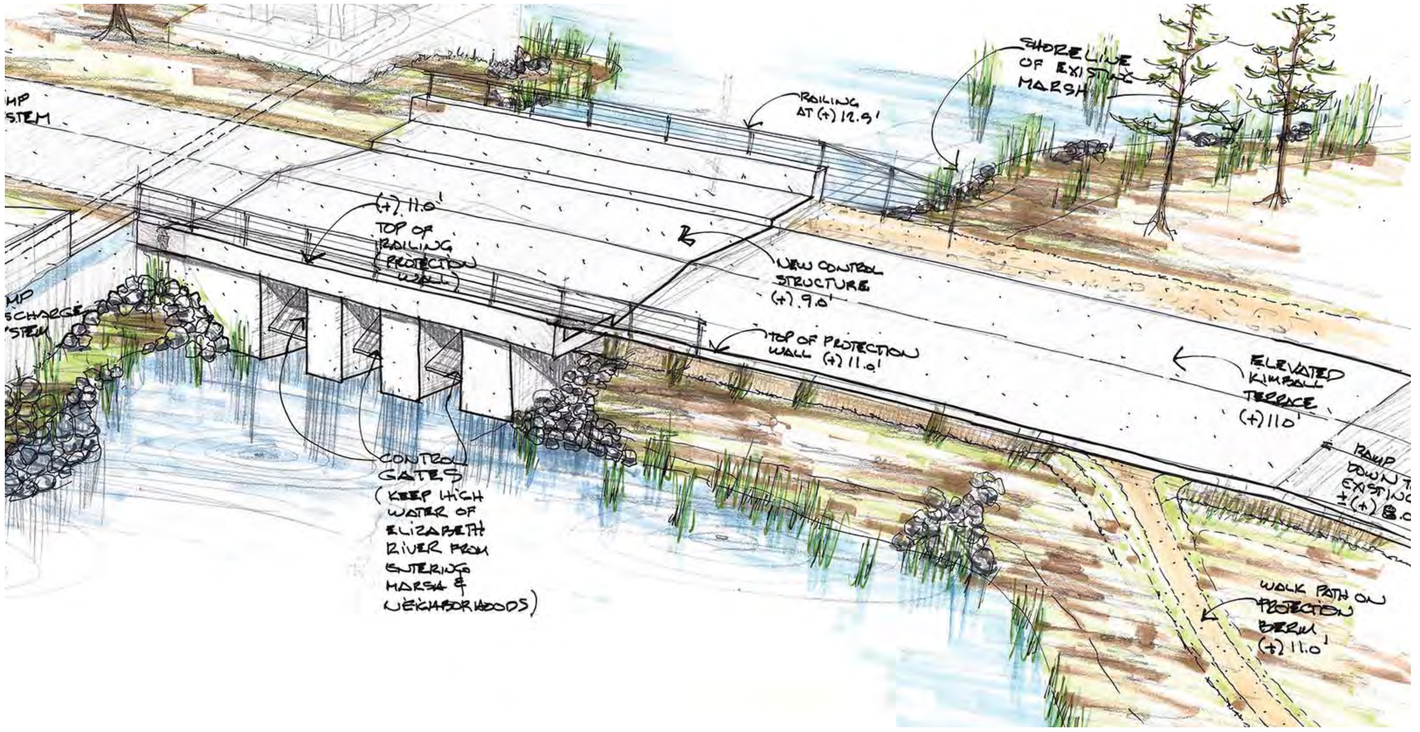
Existing shoreline grasses along the Grandy Village wetland mitigation area are susceptible to erosion.

Example living shoreline (showing stone breakwater protecting vegetation)

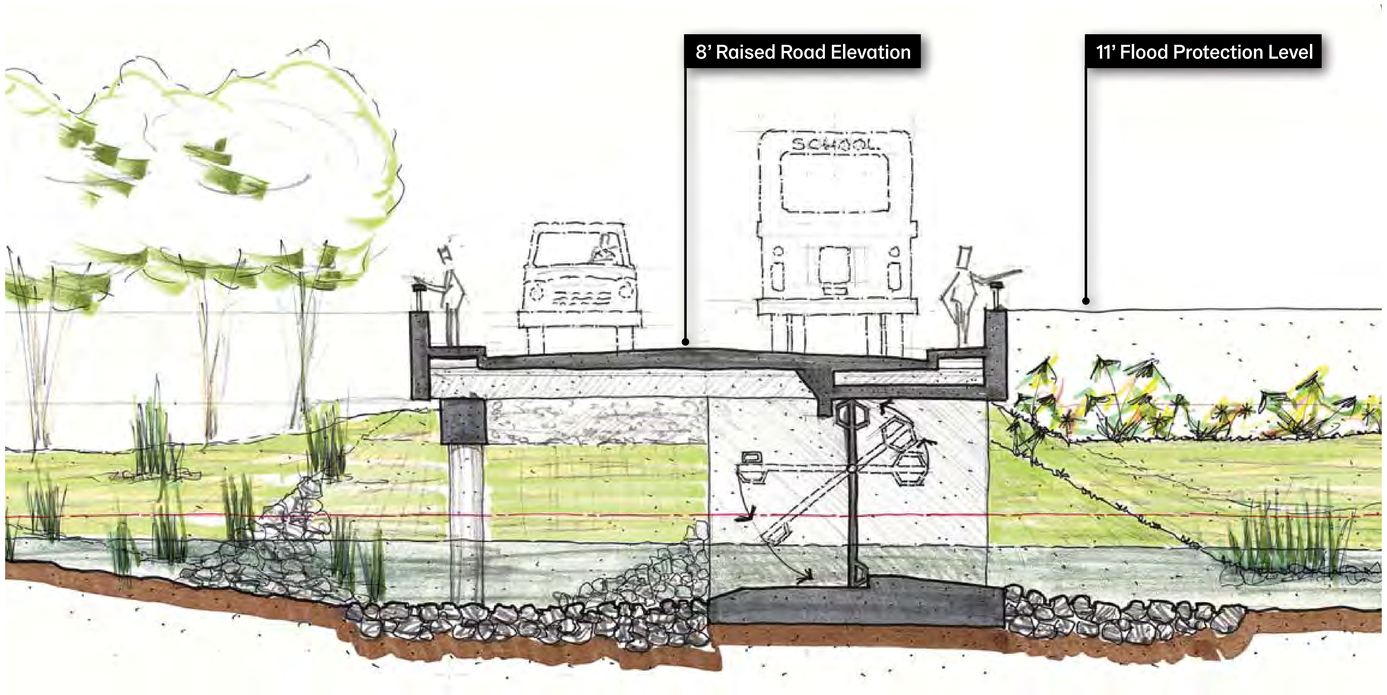
Integrated Coastal Flood Protection - Tide Gates and Raised Roads

Kimball Terrace crosses Haynes Creek as a low land bridge with a small culvert for drainage and tidal exchange

Existing tidal exchange at Kimball Terrace is piped connection. Tides frequently stack up in Haynes Creek, impounded by the limited connection.



Tide gate and flood protection integrated in new crossing and raised road at Kimball Terrace across Haynes Creek



Section Drawing through Tide Gate and Raised Road Structure across Haynes Creek

Potential Pump Station Locations

Construction of coastal flood protection will necessitate the installation of pump stations to discharge stormwater into the Elizabeth River. Drainage system upgrades and additional water storage areas aim to reduce the need for pumping.

Each pump station would be designed with a different "character" suited to its particular location and function.

Ballentine Pump Station Concept

Improved drainage pipes will convey stormwater to a new pump station located at the intersection of Kimball Terrace and Kimball Loop, along the coastal protection berm. A permeable service yard in front of the station could also provide parking for the pier.

The pump station may include:

- Pump Electrical Room
- Restrooms
- Pump room
- Heat tracing on pipes to protect from freezing pipe issues

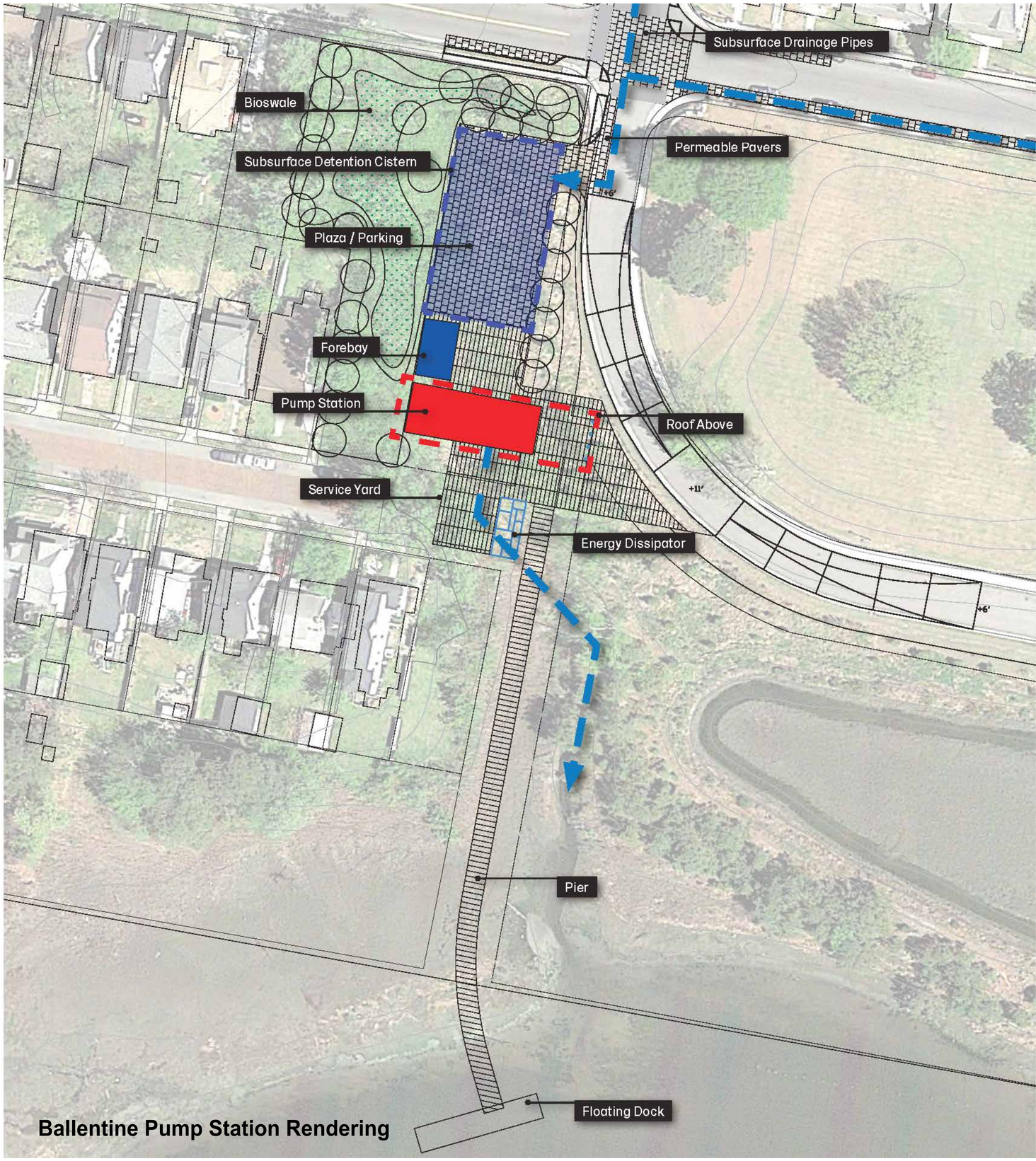
Pre-Pump built elements:

- Wet Well
- Trash Screen with Traveling Rack

Post Pump built elements:

- Dissipator to discharge area in marsh for erosion control.
- Natural gas generator with test cycling once a month.

Pump Station Rendering



Ballentine Pump Station Rendering

Street Intervention Concepts

Reducing flooding during rain events is a principal project goal. Installation of a coastal protection system and closing the drainage system to the tides necessitate finding opportunities to slow, store, and infiltrate stormwater. In addition to reducing flooding risk, street interventions are designed to provide additional runoff storage, minimize pumping requirements, demonstrate green infrastructure techniques, increase pedestrian access and safety, and beautify neighborhoods.

Visible green infrastructure improvements such as bioswales and permeable paving may be paired with subsurface cisterns and improvements to the subsurface drainage system. Utility work that requires demolition of roads could be coordinated with proposed street improvements to help develop a new "specification" for street replacement that, where possible, integrates green infrastructure and resilience best practices. Street intervention concepts include:

Green Infrastructure:

- Bioswales and corner bump-outs at selected intersections.
- Permeable paving in parking lanes and potentially in selected intersections.
- Subsurface cisterns
- Increased tree canopy along streets

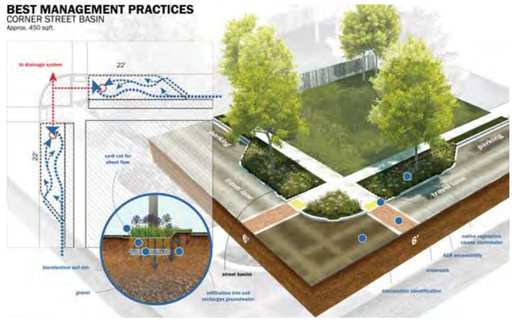
Subsurface Drainage Network Improvements

- Upsizing of existing pipes in selected areas
- Installation of new pipes in selected areas

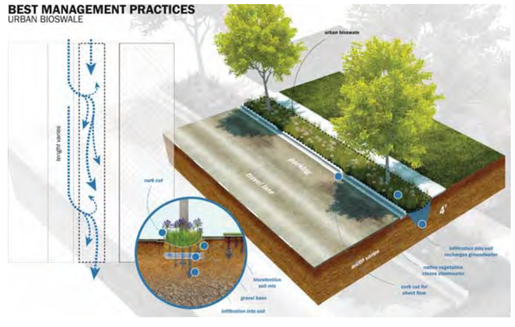
Street Intervention Concepts

Bioswales and bump-outs will be planted with native species that will help filter stormwater runoff before it either infiltrates into the ground or flows into the drainage system and is discharged into the river. Permeable parking lanes with gravel bases reduce runoff and allow for increased stormwater storage during rain events. If subsurface pipes are located under the permeable pavers, the pavers may facilitate future repair work, as they are reusble if removed.

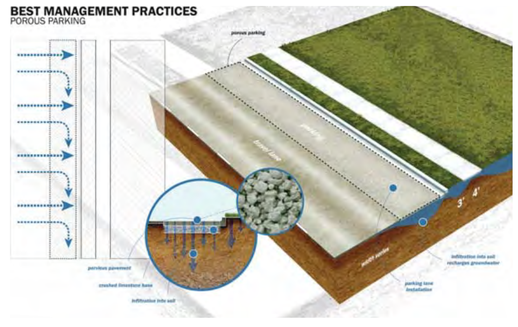
In addition to the planted bioswales and bumpouts, the project budget currently provides an allowance for planting 200 trees in order to improve the urban tree canopy. These trees could help absorb water and also reduce heat island effect.



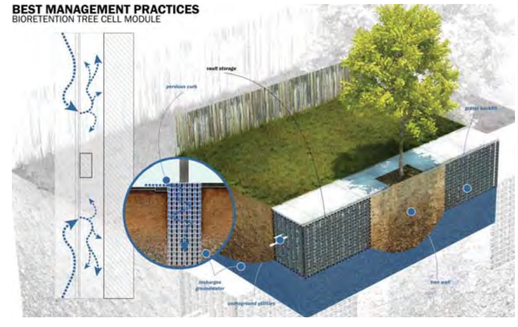
In addition to stormwater management benefits, Corner Street Basins provide traffic calming, pedestrian safety, and urban amenity.



Urban Bioswales intercept roadway runoff, capturing pollutants and stormwater, thereby reducing flooding, recharging groundwater, and improving water quality in the creeks and river.



Porous Parking can be installed using pervious concrete, bricks, or pavers. Runoff disappears into the paving, capturing pollutants and infiltrating stormwater into the ground.



Street trees have multiple benefits: carbon offsets, air quality improvement, and urban beautification.

Ballentine Corridor Improvement Concepts

Ballentine Boulevard is one of only two vehicular routes into the Chesterfield Heights / Grandy Village area. Located where Chesterfield Heights and Grandy Village meet, the corridor functions as a gateway to both neighborhoods. Ballentine Boulevard also connects the neighborhood from the river northward to the larger city. A TIDE station located just north of the I-264 underpass provides connection to the city's light rail system, while east-west corridors such as Virginia Beach Boulevard and Princess Anne Road provide access to Norfolk and surrounding cities.

Its functionality as a connector at both a neighborhood and city scale makes Ballentine Boulevard a prime location for expanding multi-modal transportation opportunities, demonstrating innovative water management strategies, and increasing access to the Elizabeth River. Several discreet projects along Ballentine Boulevard work in combination to enhance this key urban corridor:

Expanding Multi-Modal Transportation Opportunities

- Improved pedestrian and bicycle access through the I-264 underpass
- Improved and continuous sidewalk conditions from the I-264 underpass to the Elizabeth River

Demonstrating Innovative Water Management Strategies

- Bioswales along sidewalks
- Permeable paving at edge of street, in parking lanes, and at intersections

Increasing Access to the Elizabeth River

- Public pier accessed through the Ballentine Improved Corridor

Location Map

Existing Conditions

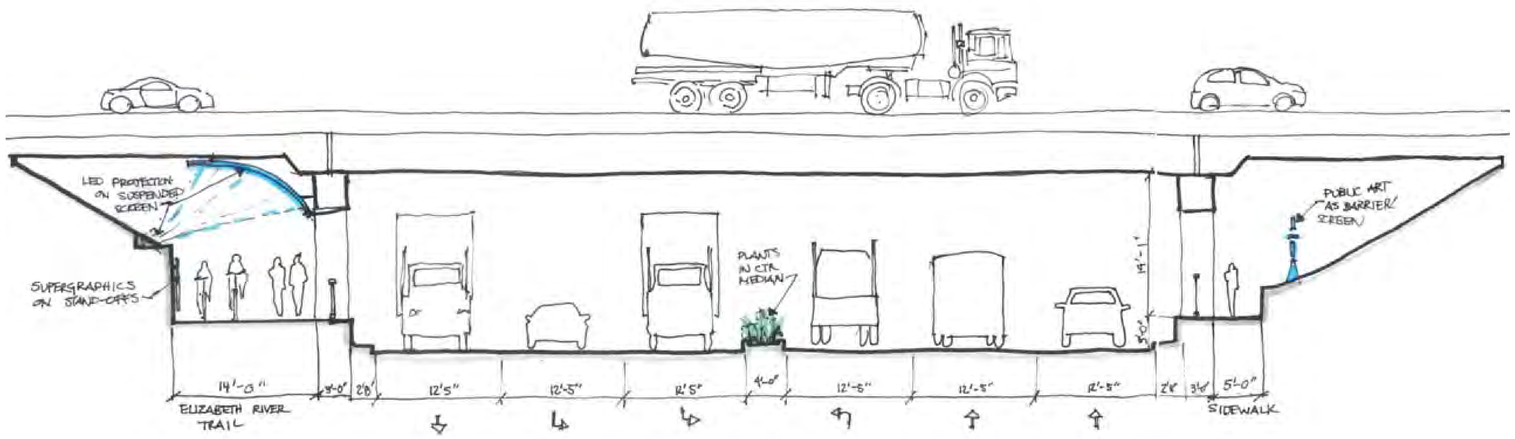
Ballentine Corridor Improvement Concepts

The walkway of the I-264 underpass can be widened by cutting back the non-structural fill on the side of the walkway. The current design calls for widening the western walkway, as it connects to the TIDE station on the northern side of the underpass. An initial width of 14′ has been suggested for the walkway, as it would accommodate both pedestrians and cyclists. The underpass improvements aim to accomplish the following:

- Widen walkway to allow both pedestrian and cyclist access.
- Improve access to underpass through high visibility crosswalks, improved signaling, and improvements to ADA accessibility.
- Improve safety of underpass through means such as better lighting, installation of an emergency call station, security cameras, etc.
- Enhance user experience through improvements to fence/screen between sidewalk and drive lanes.

Perspective of widened walkway

Example of similar improvements



Section through underpass

Grandy Village Stormwater Park Concept

Grandy Village Stormater Park

Key Plan

Existing Conditions