2021 Virginia Community Flood Preparedness Fund

Eastern Branch of Elizabeth River Wetland and Floodplain Restoration

City of Virginia Beach

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I. Appendix A – Application Form

Appendix A: Application Form for Grant Requests for All Categories

Virginia Department of Conservation and Recreation
Virginia Community Flood Preparedness Fund Grant Program

Name of Local Government:
City of Virginia Beach

Category of Grant Being Applied for (check one):

____Capacity Building/Planning

Y **____Project**

_____Study

NFIP/DCR Community Identification Number (CID) 515531

If a state or federally recognized Indian tribe, Name of tribe N/A

Name of Authorized Official: Toni Utterback

Signature of Authorized Official: Toni Utterback Digitally signed by Toni Utterback Date: 2021.09.02 08:27:56 -04'00'

Mailing Address (1): 2875 Sabre Street, Suite 250

Mailing Address (2): _____

City: Virginia Beach **State:** Virginia **Zip:** 23452

Telephone Number: (757) 385-8746 **Cell Phone Number:** (____) _____

Email Address: TPUtterback@vbgov.com

Contact Person (If different from authorized official): C.J. Bodnar

Mailing Address (1): 2875 Sabre Street, Suite 250

Mailing Address (2): _____

City: Virginia Beach **State:** VA **Zip:** 23456

Telephone Number: (757) 385-8430 **Cell Phone Number:** (____) _____

Email Address: CBodnar@vbgov.com

Is the proposal in this application intended to benefit a low-income geographic area as defined in the Part 1 Definitions? Yes ____ No ✓

Categories (select applicable project):

Project Grants (Check All that Apply)

- ☐ Acquisition of property (or interests therein) and/or structures for purposes of allowing floodwater inundation, strategic retreat of existing land uses from areas vulnerable to flooding; the conservation or enhancement of natural flood resilience resources; or acquisition of structures, provided the acquired property will be protected in perpetuity from further development.
- ☑ Wetland restoration.
- ☑ Floodplain restoration.
- ☐ Construction of swales and settling ponds.
- ☑ Living shorelines and vegetated buffers.
- ☐ Structural floodwalls, levees, berms, flood gates, structural conveyances.
- ☐ Storm water system upgrades.
- ☐ Medium and large scale Low Impact Development (LID) in urban areas.
- ☐ Permanent conservation of undeveloped lands identified as having flood resilience value by *ConserveVirginia* Floodplain and Flooding Resilience layer or a similar data driven analytic tool.
- ☐ Dam restoration or removal.
- ☐ Stream bank restoration or stabilization.
- ☐ Restoration of floodplains to natural and beneficial function.
- ☐ Developing flood warning and response systems, which may include gauge installation, to notify residents of potential emergency flooding events.

Study Grants (Check All that Apply)

- ☐ Studies to aid in updating floodplain ordinances to maintain compliance with the NFIP or to incorporate higher standards that may reduce the risk of flood damage. This must include establishing processes for implementing the ordinance, including but not limited to, permitting, record retention, violations, and variances. This may include revising a floodplain ordinance when the community is getting new Flood Insurance Rate Maps (FIRMs), updating a floodplain ordinance to include floodplain setbacks or freeboard, or correcting issues identified in a Corrective Action Plan.
- ☐ Revising other land use ordinances to incorporate flood protection and mitigation goals, standards and practices.
- ☐ Conducting hydrologic and hydraulic studies of floodplains. Applicants who create new maps must apply for a Letter of Map Revision or a Physical Map Revision through the Federal Emergency Management Agency (FEMA). For example, a local government might conduct a hydrologic and hydraulic study for an area that had not been studied because the watershed is less than one square mile. Modeling the floodplain in an area that has numerous letters of map change that suggest the current map might not be fully accurate or doing a detailed flood study for an A Zone is another example.
- ☐ Studies and Data Collection of Statewide and Regional Significance.
- ☐ Revisions to existing resilience plans and modifications to existing comprehensive and hazard.
- ☐ Other relevant flood prevention and protection project or study.

<u>Capacity Building and Planning Grants</u>

- ☐ Floodplain Staff Capacity.
- ☐ Resilience Plan Development
  - ☐ Revisions to existing resilience plans and modifications to existing comprehensive and hazard mitigation plans.
  - ☐ Resource assessments, planning, strategies and development.
    - Policy management and/or development.
    - Stakeholder engagement and strategies.

Location of Project (Include Maps): Eastern Branch of the Elizabeth River

NFIP Community Identification Number (CID#):(See appendix F 515531

Is Project Located in an NFIP Participating Community? ☑ Yes ☐ No

Is Project Located in a Special Flood Hazard Area? ☑ Yes ☐ No

Flood Zone(s) (If Applicable): Zone AE (EL 8 Feet)

Flood Insurance Rate Map Number(s) (If Applicable): 5155310079G and 5155310083G

Total Cost of Project: $8,475,780.00

Total Amount Requested $5,933,046.00

II. Appendix B – Completed Scoring Criteria Sheet

Appendix B: Scoring Criteria for Flood Prevention and Protection Projects

Virginia Department of Conservation and Recreation
Virginia Community Flood Preparedness Fund Grant Program

Applicant Name:	

Eligibility Information		
Criterion	**Description**	**Check One**
1. Is the applicant a local government (including counties, cities, towns, municipal corporations, authorities, districts, commissions, or political subdivisions created by the General Assembly or pursuant to the Constitution or laws of the Commonwealth, or any combination of these)?		
Yes	Eligible for consideration	✓
No	Not eligible for consideration	
2. Does the local government have an approved resilience plan and has provided a copy or link to the plan with this application?		
Yes	Eligible for consideration under all categories	✓
No	Eligible for consideration for studies, capacity building, and planning only	
3. If the applicant is <u>not a town, city, or county</u>, are letters of support from all affected local governments included in this application?		
Yes	Eligible for consideration	
No	Not eligible for consideration	
4. Has this or any portion of this project been included in any application or program previously funded by the Department?		
Yes	Not eligible for consideration	
No	Eligible for consideration	✓
5. Has the applicant provided evidence of an ability to provide the required matching funds?		
Yes	Eligible for consideration	✓
No	Not eligible for consideration	
N/A	Match not required	

Project Eligible for Consideration	☑ Yes ☐ No
Applicant Name:	

Scoring Information		
Criterion	**Point Value**	**Points Awarded**
6. Eligible Projects (Select all that apply)		
Projects may have components of both 1.a. and 1.b. below; however, only one category may be chosen. The category chosen must be the primary project in the application.		
1.a. Acquisition of property consistent with an overall comprehensive local or regional plan for purposes of allowing inundation, retreat, or acquisition of structures.	**50**	0
☑ Wetland restoration, floodplain restoration ☑ Living shorelines and vegetated buffers. ☐ Permanent conservation of undeveloped lands identified as having flood resilience value by *ConserveVirginia* Floodplain and Flooding Resilience layer or a similar data driven analytic tool ☐ Dam removal ☑ Stream bank restoration or stabilization. ☐ Restoration of floodplains to natural and beneficial function. ☐ Developing flood warning and response systems, which may include gauge installation, to notify residents of potential emergency flooding events.	**45**	45
1.b. any other nature-based approach	**40**	0
All hybrid approaches whose end result is a nature-based solution	**35**	0
All other projects	**25**	0
7. Is the project area socially vulnerable? (Based on ADAPT VA's Social Vulnerability Index Score.)		
Very High Social Vulnerability (More than 1.5)	**15**	0
High Social Vulnerability (1.0 to 1.5)	**12**	0
Moderate Social Vulnerability (0.0 to 1.0)	**8**	8
Low Social Vulnerability (-1.0 to 0.0)	**0**	0
Very Low Social Vulnerability (Less than -1.0)	**0**	0
8. Is the proposed project part of an effort to join or remedy the community's probation or suspension from the NFIP?		

Yes	**10**	0
No	**0**	0
9. Is the proposed project in a low-income geographic area as defined in this manual?		
Yes	**10**	0
No	**0**	0
10. Projects eligible for funding may also reduce nutrient and sediment pollution to local waters and the Chesapeake Bay and assist the Commonwealth in achieving local and/or Chesapeake Bay TMDLs. Does the proposed project include implementation of one or more best management practices with a nitrogen, phosphorus, or sediment reduction efficiency established by the Virginia Department of Environmental Quality or the Chesapeake Bay Program Partnership in support of the Chesapeake Bay TMDL Phase III Watershed Implementation Plan?		
Yes	**5**	5
No	**0**	0
11. Does this project provide "community scale" benefits?		
Yes	**20**	20
No	**0**	0
Total Points		78

III. Appendix D – Checklist for All Categories

Appendix D: Checklist All Categories

Virginia Department of Conservation and Recreation

Community Flood Preparedness Fund Grant Program

Scope of Work Narrative	
Supporting Documentation	**Included**
Detailed map of the project area(s) (Projects/Studies)	☑ Yes ☐ No ☐ N/A
FIRMette of the project area(s) (Projects/Studies)	☑ Yes ☐ No ☐ N/A
Historic flood damage data and/or images (Projects/Studies)	☑ Yes ☐ No ☐ N/A
A link to or a copy of the current floodplain ordinance	☑ Yes ☐ No ☐ N/A
Non-Fund financed maintenance and management plan for project extending a minimum of 5 years from project close	☑ Yes ☐ No ☐ N/A
A link to or a copy of the current hazard mitigation plan	☑ Yes ☐ No ☐ N/A
A link to or a copy of the current comprehensive plan	☑ Yes ☐ No ☐ N/A
Social vulnerability index score(s) for the project area from ADAPT VA's Virginia Vulnerability Viewer	☑ Yes ☐ No ☐ N/A
If applicant is not a town, city, or county, letters of support from affected communities	☐ Yes ☐ No ☑ N/A
Completed Scoring Criteria Sheet in Appendix B, C, or D	☑ Yes ☐ No ☐ N/A
Budget Narrative	
Supporting Documentation	**Included**
Authorization to request funding from the Fund from governing body or chief executive of the local government	☑ Yes ☐ No ☐ N/A
Signed pledge agreement from each contributing organization	☐ Yes ☐ No ☑ N/A

IV. Required Application Components

B: Scope of Work Narrative - Projects

1. Project Information

The City of Virginia Beach ("City") is pleased to submit this project for consideration under the Flood Prevention and Protection Projects category of the 2021 Virginia Community Flood Preparedness Fund. The City has made significant investments in the study of historical flooding data, current and future hydrology, and the projected increase in flood frequency due to changing rainfall patterns and sea level rise. These studies culminated in Virginia Beach's Resilience Plan, socialized as "Sea Level Wise" [1], which represents a conceptual suite of projects focused on flood control and resilience. This extensive research, data collection, and analysis were utilized to aid in the selection of the proposed project for this grant application.

The Virginia Beach Resilience Plan leverages four adaptation focus areas to identify actionable projects for each of the City's four major watersheds. The proposed project was identified under the "natural mitigations" focus area (see *Part IV: Section E1 -Project Map 1*). It is located in the Elizabeth River Watershed – a dense residential, commercial, and industrial waterfront. The Eastern Branch of the Elizabeth River is the most important flood entry point into the Elizabeth River watershed. The Eastern Branch provides a connection to the main stem of the Elizabeth River which connects to the James River, then eventually, on to the Chesapeake Bay. Tidal creeks extending from the main stem of the river connect inland areas to the waterfront.

Nature-based solutions are an integral element to achieve flood reduction and habitat restoration in the watershed. Wetland restoration, living shorelines, and floodplain restoration along the Elizabeth River were identified as key resilience-building strategies as part of an extensive evaluation of structural and non-structural alternatives. The proposed project represents the first nature-based adaptation project to advance to design in the Elizabeth River Watershed – a true indication of the City's commitment to natural and nature-based approaches and the critical first step in the broader adaptation vision for the watershed, the City, and the region.

The following project information provides details regarding the project site and highlights the impacted population, residential and commercial structures, and critical facilities in and around the project site. This section also provides an overview of the proposed design features at the site.

a. Project Site Description

In an assessment of opportunities for restoration projects with dual flood reduction and habitat restoration benefits, the project site was chosen for several reasons, including land ownership, flood risk, and habitat restoration objectives – further described in the following

[1] City of Virginia Beach (2020). Virginia Beach Sea Level Wise Adaptation Strategy (PDF).

sections.

The selected project site is composed of two separate areas of City-owned land (Project Area 1 and Project Area 2), located along the Eastern Branch of the Elizabeth River. A more detailed description and notable characteristics of Project Areas 1 and 2 are provided below.

Project Area 1:

Project Area 1 is comprised of two parcels of City-owned land: Arrowhead Elementary School and the Woods of Avalon Park, shown in Figure 1 below.

Arrowhead Elementary School site is a 22.9-acre forested peninsula that contains approximately five (5) acres of estuarine and marine wetland and a freshwater pond. The site is surrounded by the Arrowhead residential neighborhood.

The Woods of Avalon site is a 13.2-acre peninsula that contains approximately eight (8) acres of estuarine and marine wetlands. The site is maintained by the Virginia Beach Department of Parks and Recreation. Park amenities include a picnic shelter and playground. Access to the water is limited to one roadway that dead-ends close to the edge of the marsh. The park is surrounded by the Woods of Avalon residential neighborhood.

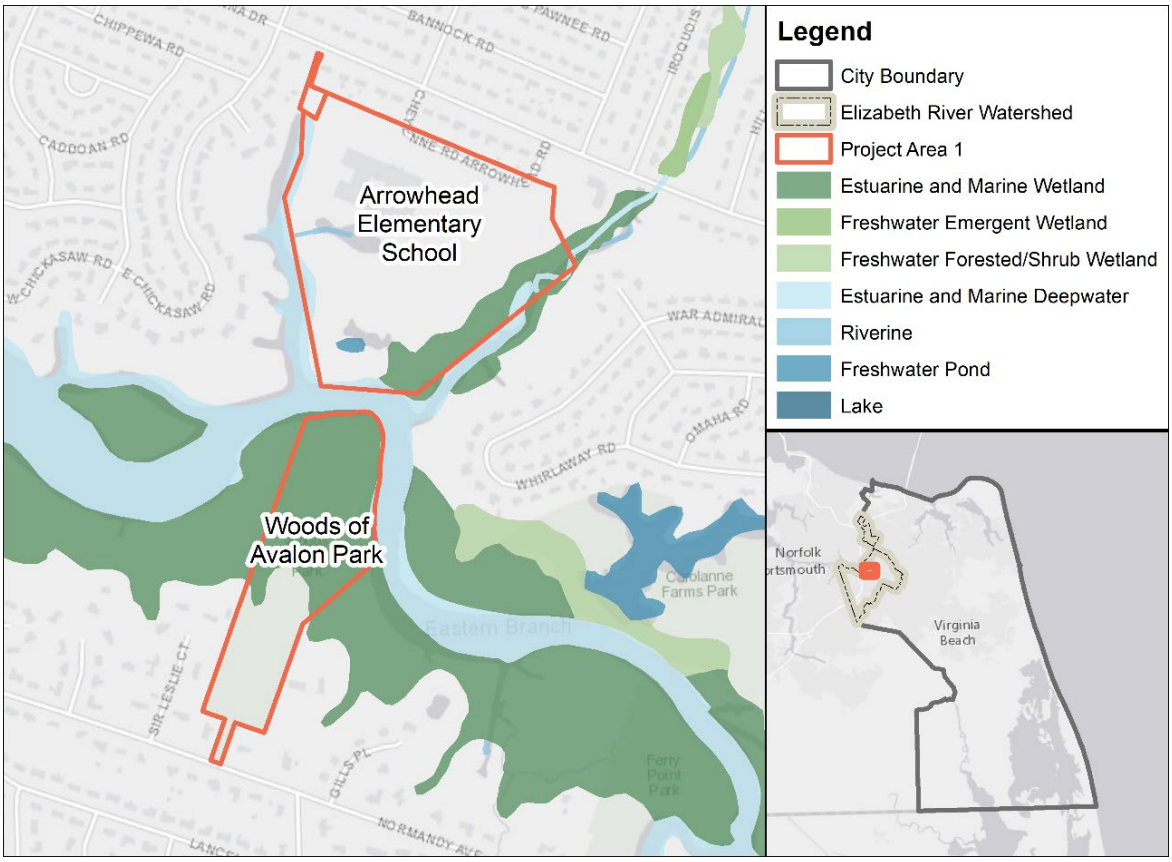


Figure 1: Project Area 1 Overview.

Project Area 2:

Project Area 2, located less than half a mile upstream of Project Area 1, is comprised of three parcels of City-owned land maintained by the Virginia Beach Department of Parks and Recreation: Ferry Point Park and Carolanne Farms Neighborhood Park, as shown in Figure 2 below.

Carolanne Farms Park is a total of 22-acres, on two parcels, that contains approximately 8.5-acres of forested and shrub wetland. Recreational amenities include several walking trails as part of the Elizabeth River Nature and Canoe Trail as well as an ADA-accessible kayak launch and fishing area. The park is surrounded by the Carolanne Farm residential neighborhood.

Ferry Point Park, located directly across the river, is a nine (9) acre parcel that contains 6.5-acres of estuarine and marine wetland. The City recently acquired this property at the beginning of 2018, recognizing the potential for environmental education and shoreline restoration opportunities at the site. The park was opened to the public in the summary of 2018. The site has a buffer of mature canopy trees along the Elizabeth River, making it a great opportunity for conservation efforts.

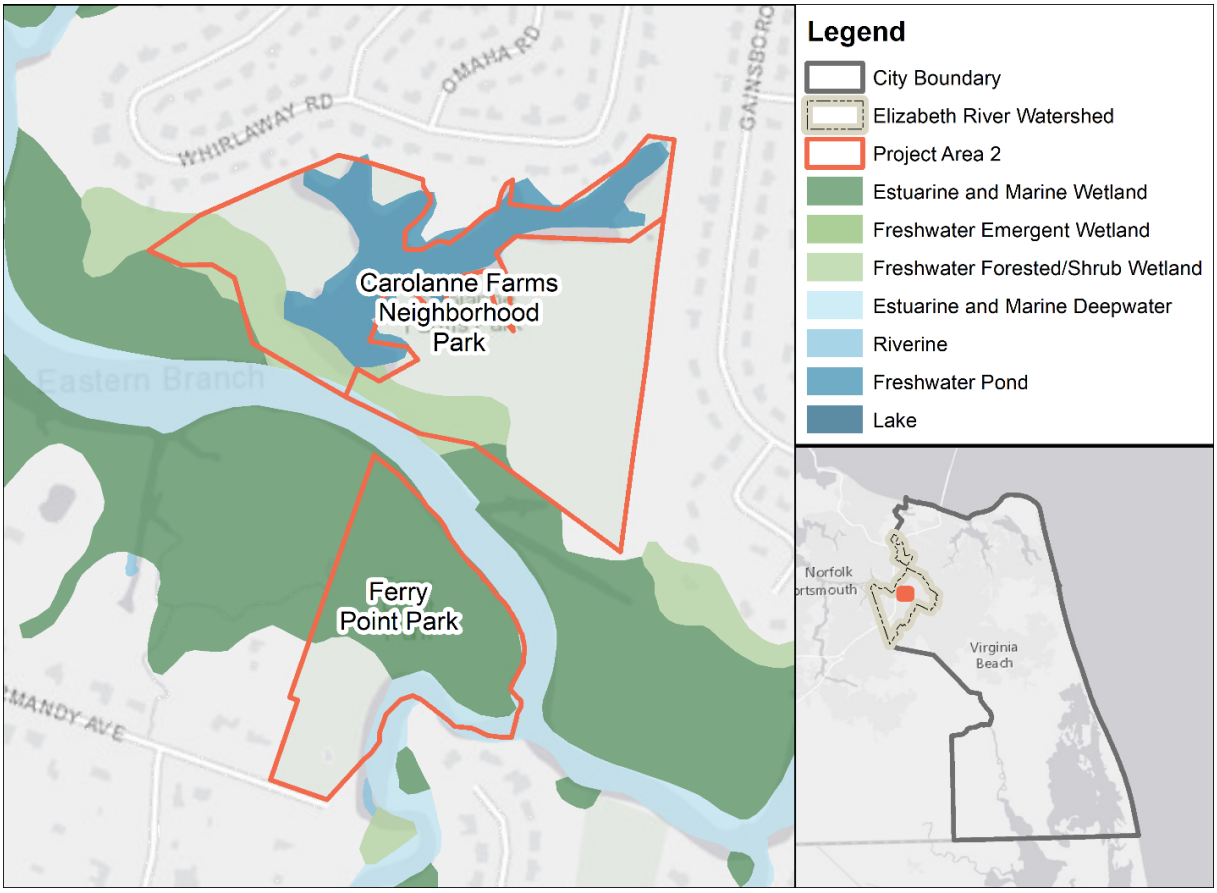


Figure 2: Project Area 2 Overview.

Proposed Flood Risk Reduction Measures:

The Virginia Beach Resilience Plan included a city-wide evaluation of site suitability and opportunities for nature-based strategies.[2] This assessment identified a combination of living shorelines, wetland/floodplain restoration, and land conservation strategies along the Eastern Branch of the Elizabeth River (see *Part IV: Section E1 -Project Map 3*).

The City has built upon this assessment through the development of 15% conceptual design plans. Base mapping, cross-sections, and river profiles were developed for Project Area 1 and Project Area 2 to identify locations of feasible project design components (see *Part IV: Section E1 – Project Map 3 and Project Map 4*). The preliminary design features can be categorized into three main project types as defined in the *2021 Grant Manual for the Virginia Community Flood Preparedness Fund*:

- **Wetland Restoration**: The project includes wetland restoration along the shorelines of Woods of Avalon Park and Ferry Point Park. Wetland restoration will involve excavation of high ground locations, regrading, and replanting with native vegetation. The restored wetlands will improve floodplain connectivity and provide increased storage capacity during flood events.
- **Living Shoreline**: The project includes installation of living shorelines along the water's edge of the Arrowhead Elementary School and Carolanne Farm Neighborhood Park. The living shorelines will function to decrease wave heights along the marsh edge, mitigating erosion during extreme events. Two primary types of living shoreline approaches will be implemented based on the wave energy along the inside and outside of the river meander bends:
    - *Coir logs* are proposed in low to moderate energy sections of the shoreline. The coir logs will provide temporary protection to allow for the growth of vegetation. The coir log will eventually disintegrate and the native wetland vegetation will take its place, acting as a shoreline buffer. These mitigation tools will work to stabilize and restore the river bank. Vegetation will grow up and around the coir logs, eventually creating living shorelines.
    - *Marsh sills* are proposed for the higher energy sections of the shoreline located outside of the river meander bends. The sills will be composed of rip rap or other construction materials such as oyster castles.

  The living shorelines will be visible from the nature trails along both parks and educational signage will be incorporated into the project design.
- **Floodplain Restoration**: To support the installation of the restored wetlands and living shorelines, it is necessary to increase the overall stormwater conveyance around the project site. An increase in stormwater conveyance – or the ability to increase drainage

[2] City of Virginia Beach (2019). Nature-Based Coastal Flood Mitigation Strategies (PDF).

capacity and capability in the wetlands area bordering the project site, will take the form of both stormwater wetlands and drainage/stormwater channel stabilization and expansion. These features will help provide additional storage capacity during combined coastal/riverine and stormwater runoff events to reduce flooding within the residential neighborhood surrounding the project site, as well as provide erosion protection of the wetland restoration and living shoreline design features.

The proposed design features will work together to restore the wetlands and natural channel sinuosity, promote healthy sediment distribution and improve water quality, and provide improved storage capacity during existing and future flood events.

These natural interventions will also provide tangible benefits to the surrounding residential properties beyond flood risk reduction, offering increased wildlife habitats, additional recreational opportunities, and educational partnerships and hands-on learning experiences with Arrowhead Elementary School and the various amenities distributed throughout the park

b. Population

The Elizabeth River project spans three (3) census block groups (518100460.024, 518100450.094, and 51800460.102), shown in Figure 3, which has a total population of 4,850. The residential population has grown approximately 1% in the past two decades. The median household income in 2021 dollars is $76,335. There are approximately 1,750 residential housing units, 73% which are owner-occupied, 24% which are renter occupied, and 3% which are vacation rentals. Residents are 73% White, 16% Black, 8% Hispanic, and 3% other.

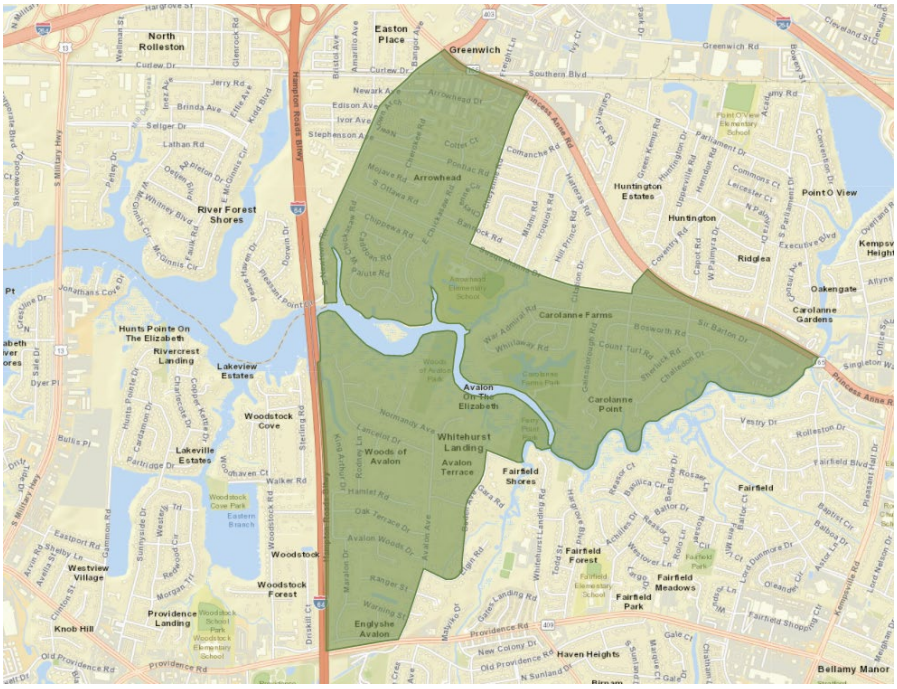


Figure 3: Census blocks associated with the proposed project.

c. Historic Flooding Data and Hydrologic Studies Projecting Flood Frequency

Historical and Existing Flood Data

The project is located within a Federal Emergency Management Agency (FEMA) mapped Special Flood Hazard Area (SFHA), as shown in *Part IV: Section E1 - Project Map 5*. The City maintains records of where residents report flood issues, and what type of flooding is causing the issue. Residents regularly report flood issues through a hotline which is then recorded in a flood event database. Within a half-mile radius around the project location, there have been over forty (40) instances of flood reports associated with heavy rain or high tide recorded in the database between 2001 and 2019. An example of flooding of residential areas surrounding the project is shown in Figure 4.

Figure 4: Historic flood image provided by resident of the Carolanne Farms Neighborhood.

Projected Flood Frequency

A detailed economic flood loss assessment showed that almost 10 % of the entire risk exposure in the City is concentrated in the Elizabeth River Watershed (*see Part IV, Section E: Project Map 2)*[3]. Annual average flood losses in the Elizabeth River Watershed are approximately $830,388 thousand, but are expected to increase to $8,353,501 million with 3 feet of sea level rise projected by 2070. This represents a 10-fold increase from present-day conditions.

As shown in *Part IV: Section E1 -Project Map 5*, the City's future conditions modeling indicates

[3] City of Virginia Beach (2020). Coastal Flood and Economic Loss Analysis (PDF).

that the school and residential neighborhoods surrounding the project site begins to experience flooding in a 25-year storm event. Multiple residential structures and public streets are flooded throughout the neighborhood, which becomes exacerbated with sea level rise (*see Part IV: Section E1 - Project Map 6*). In addition to projected increases in flood depth and extent, the project area is also expected to withstand habitat degradation in response to sea level rise. (*see Part IV: Section E1 - Project Map 7*). The concentration of economic and ecological impacts in this area was used to identify the strategic placement of the proposed design features.

d. Local Government to Provide its Share of the Cost

The City of Virginia Beach is fully prepared to cover the cost share of the proposed project, as highlighted in the attached budget narrative, "Amount of Cash Funds Available." The funding for the grant match is contained within the City budget.

e. Local Floodplain Management Regulations

The City recognizes the vital importance of floodplains in the natural movement of water through the community.

Appendix K of the Virginia Beach Code of Ordinances regulates development in the community's floodplains. The City requires that a permit is obtained for any construction or development in the special flood hazard area.

For more information and details regarding the City's floodplain management and ordinances, please see:

- Link to current floodplain ordinance: Virginia Beach Floodplain Ordinance

In addition, a copy of the current floodplain ordinance has been included in *Part IV, Section E5*.

For further information regarding the City's hazard mitigation and comprehensive planning, please visit the following:

- Link to current hazard mitigation plan: Regional Hazard Mitigation Planning
- Link to current comprehensive plan: Virginia Beach Comprehensive Planning

f. Repetitive Loss and/or Severe Repetitive Loss Properties

The repetitive loss database shows twenty (20) repetitive loss properties within the three (3) census block groups (518100460.024, 518100450.094, and 51800460.102) associated with the project area.

g. Residential and/or Commercial Structures

The neighborhoods surrounding the project site predominantly consist of low-density residential neighborhoods. Within a half-mile radius around the project site, there are 39 commercial structures and approximately 2,700 residential structures. Of those commercial structures, approximately 1,000 structures are vulnerable to flooding during a 25-year event today, and 2,000 are vulnerable during a 25-year event with 3 feet of sea level rise. This equates to over 70% of the residential structures within the project vicinity having exposure to coastal flooding with sea level rise, resulting in what Virginia Beach would consider as high community exposure and further highlighting the importance of this proposed project.

h. Critical Facilities

There are two (2) critical facilities located within the proposed project site, one school (Arrowhead Elementary School) and one wastewater treatment facility (Arrowhead Susquehanna Treatment Facility) – *see Part IV, Section E: Project Map 6*. Within a half-mile radius around the project site, there are an additional six (6) critical facilities.

2. Need for Assistance

The City of Virginia Beach has invested significant time, money, and resources in understanding, planning for, and communicating the threats of sea level rise and recurrent flooding to the community. The planning stage is now complete, and the City is ready to turn to implementation. Virginia Beach understands that the costs of mitigating the community are substantial and is seeking funds to support the implementation of vital mitigation projects, alongside dedicated resources that the City is procuring.

Monetary support to implement the proposed project will benefit not only Virginia Beach and the surrounding community members but will have trickle-down impacts for the broader Elizabeth River Watershed. The proposed project sites are adjacent to Norfolk and will provide an opportunity for collaboration and multi-jurisdictional benefits. In addition, the proposed project will be the first step in the Elizabeth River restoration, offering a powerful example of how large-scale nature-based solutions can positively impact the community and broader watershed area.

In addition, Virginia Beach has chosen to prioritize this project due to its location near Arrowhead Elementary School. The proximity to the school is twofold, both reduce the risk to this critical facility from recurrent flooding, but also provide the opportunity for partnerships and educational opportunities for natural and nature-based learning.

The social vulnerability index score varies across the project site, ranging from -0.3 (Low Social Vulnerability) to 0.2 (Moderate). It is anticipated that this project would also benefit downstream communities extending into Norfolk. The communities on the north side of the Eastern Branch of the Elizabeth River, less than half a mile downstream of the project site, have a social vulnerability index score of 1.6 (Very High Social Vulnerability).

3. Goals and Objectives

The primary goal of this project is to design, permit, and implement a flood resilience and protection project along City-owned properties adjacent to the Eastern Branch of the Elizabeth River in Virginia Beach, Virginia. Our goal will be realized through the following objectives.

Objective 1 – Stakeholder Engagement

Engage, coordinate, and leverage stakeholder input throughout the project delivery process – throughout the preliminary and final designs, construction, and post-construction monitoring to ensure local acceptance, regional relevance, and maximize value through lessons learned dissemination.

Expected Benefits:

- Buy-in and acceptance of preferred design alternative broadened knowledge of purpose and design objectives.

Objective 2 – Final Design and Permitting

Leverage living shoreline design standards to develop 95% engineering and design plans and secure required permits to support construction.

Expected Benefits:

- Appropriate permitting agencies have been consulted in the early stages of the design process.
- The project addresses any potential barriers to implementation.
- Shovel-ready project ready to support follow-on implementation.

Objective 3 – Project Implementation

Support on-the-ground implementation through contractor procurement, construction, and development of a post-construction monitoring and maintenance plan to ensure long-term success.

Expected Benefits:

- Flood risk reduction to communities downstream of the project area.
- Reduction of marsh-edge erosion along the river meander bends.
- Identification of long-term maintenance requirements.
- Recreation and educational opportunities to the school, surrounding neighborhoods, and the larger community.

4. Approach, Milestones, and Deliverables

The following approach, milestones, and deliverables lay out a plan of action. The milestone schedule follows in *Section B: Milestone Schedule*.

a. Approach & Deliverables

Objective 1 – Stakeholder Engagement

Activity 1.1 – Regulatory Agency Scoping

The City will host a workshop to convene regulatory stakeholders with jurisdiction over the project area, including the U.S. Army Corps of Engineers, Virginia Marine Resource Commission (VMRC), Virginia Department of Environmental Quality (DEQ), and the local wetlands board, to identify feasibility considerations, permitting requirements, and field conditions affecting design and constructability.

Deliverables:

- Pre-meeting materials including briefing pamphlet/PowerPoint presentation
- Technical Memo Documenting Agency Feedback and Recommendations

Activity 1.2 – Public Outreach and Education

The City will conduct public outreach meetings at key junctions in the design process (30% and 60%) and capture community input at a public outreach meeting.

Deliverables:

- Public Meeting at 30% Design Stage
- Public Meeting between 60% and 95% Design Stage
- Establish project page on City website as a center for public relations (In-Kind)

Objective 2 – Final Design and Permitting

Activity 2.1 – Field Investigations

Before initiating data collection activities, the City will prepare and obtain required permits or authorizations to conduct surveys and monitoring research in the Elizabeth River, including:

- Nationwide Permit #5 to authorize leaving monitoring equipment at the project site.
- Nationwide Permit #6 for Survey Activities to support the geotechnical boring investigations. This permit allows for work within Waters of the U.S. to begin survey-related work on a project before plans being at a level where submittal of a full permit for the project design and permitting. Data loggers will be established to calibrate tide-storm levels for the Project Areas to the nearest tidal gage to establish proposed design elevations.

After required permits/authorizations are secured, the City will compile existing datasets, and coordinate with identified subcontractors to survey baseline field conditions at the identified project site. This baseline field data will support the development of engineering design criteria. The data will also serve as an input for evaluating the most effective design of the project features to meet the project goals and objectives. A list of environmental variables and the collection approach are listed and described below:

- Field and Bathymetric Survey: A bathymetric survey of the project site will provide design elevations and include a survey of reference elevations for existing wetlands within the project vicinity;
- Project Area property owner listings and boundary surveys associated with required Temporary and Permanent Drainage-Maintenance Easements, required for final design.
- Geotechnical Survey and Investigations: An evaluation of subsurface conditions anticipated to be encountered at locations of proposed excavation will be performed.
- Phase 1 Site Assessment: Existing site data provided for publicly owned parcels will be reviewed in addition to other secondary source information to verify that waste sites, or potential areas of contamination do not exist within the Project Areas. If encountered, avoidance will be exercised. Reviews of identified areas of required easements will also be performed.
- Cultural Resources Reviews: A review will be performed to identify potential sites requiring additional investigation. Historically Significant Sites are not anticipated to exist within the project areas. Additional evaluations and investigations will be performed where required in coordination with the State Historical Commission to avoid or mitigate impacts.
- Threatened and Endangered Species Reviews: Review will be performed to identify potential species of concern. Coordination with state (DEQ) and federal agencies including US Fish and Wildlife Service (USFWS) will be performed. Avoidance of potential habitat will be performed using protective measures and/or construction-related timing restrictions as applicable. Phase 2 Assessment-Surveys are not anticipated.
- Wetland Study: Study will be conducted in accordance with the United States Army Corps of Engineers (USACE) Wetland Delineation Manual (USACE, 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Southeast Coastal Region (Version 2.0, Nov. 2010). Impacts will be identified and mitigation through on-site restoration of floodplain wetlands will be performed.
- Geomorphologic Assessment: Assessment will be performed in accordance with state and federal requirements for permitting and design development. The assessment will be performed by a Rosgen Level 4 certified Fluvial Geomorphologic Natural Channel

Design (NCD) practitioner. Bankfull features will be identified and evaluated in concert with the tidal and flow-water level data to assist in developing the design-related elevations. The detailed assessment report will provide the results of the above-listed evaluations within a single document to provide detailed environmental features mapping, permitting analysis, and design development criteria for the NCD and Natural-Nature Based Solutions outlined within the attached Technical Basis Report for Pre-Concept Design (15%) Phase.

Deliverables:

- Field Survey Data Reports and Mapping Database
- List of Project Area Property Owners and Tax Map Parcel Boundary Mapping
- Wetlands Identification Delineation, Impacts, and Alternatives Analysis and Mitigation Report
- Cultural Resources Evaluation and Clearance Documentation Report
- Threatened and Endangered Species Coordination Documentation
- Phase 1 Site Assessment- Waste Management Report
- Detailed Geomorphologic Assessment, Evaluation Report, and Project Area design development base mapping showing identified environmental-permitting and constraints-avoidance features.

Assumptions:

- The design will avoid impacts to "historically significant" Cultural Resources, threatened and endangered species habitat, and areas of environmental concern (AOCs), to the maximum extent possible.

Activity 2.2 – Engineering Design

The project team will leverage the collected field data, in conjunction with the existing hazard outputs from the city's Resilience Plan, to develop technical design criteria for existing and future condition scenarios. Hydrologic and Hydraulic HEC-RAS modeling will also be performed and developed for the Project Area to calibrate field-collected data including tidal levels and flows, bankfull elevations and to aid in predicting future flood levels-sea level rises and determine levels of attenuation provided by the outlined design alternatives.

Stormwater drainage outfalls will be field evaluated and analyses performed to determine appropriate pipe sizes and replacement requirements, outfall stabilization and backflow preventer criteria as well as tributary restoration NNBF solutions including NCD Step-Pool Stormwater Conveyance tributary designs.

Water surface elevation data, provided by the detailed hydraulic analyses, will inform the design related to floodplain-wetland and stormwater wetland design criteria, channel bank

shear stress values- resistant material sizing requirements, and planting requirements. Nuisance and Invasive Species Management Plan and Post-Construction Monitoring requirements will be outlined for the Project area with prescribed controls and adaptive management measures identified at the pre-, during- and post-construction phases of project development. Where required, wetland mitigation will be incorporated into the design development plans.

Under this activity, the project team will develop engineering and design plans, including a construction schedule and staging plan for implementation. Preliminary cost estimates will be developed at the 60% design level and refined at the 95% design level. Technical specifications and bid quantities will be developed for construction procurements, including proposed materials, quantities, and sources for the project features. The City will coordinate with a subcontractor to develop final conceptual renderings of the final design alternative. The renderings will include details of the proposed landscape features and will be composited from aerial photography, CAD files, and hand or computer rendered imagery. These renderings will also benefit the public outreach efforts for this project by allowing the public to visualize the project and its benefits to their community.

Deliverables:

- Basis of Design: Detailed Geomorphologic Assessment, Evaluation and Design Report;
- Hydrologic and Hydraulic Analyses- Coastal Sea Level Rise Report
- 30%, 60%, and 90% design plans
- Design renderings
- Final plans, specifications, and bid sheets
- Construction cost estimates
- Construction schedule estimate

Activity 2.3 – Permitting

Once quantities of dredge and fill material below Mean Low Water (MLW) have been quantified (typically after approval of the 60% design stage), the project team will prepare and file a Joint Point Permit Application (JPA). The JPA includes the amounts and types of waters and wetlands proposed to be impacted and an alternatives analysis detailing the avoidance and minimization efforts made as part of the design process. The application will also include the results of a database search on any Threatened and Endangered (T&E) and historic and cultural resources present in the vicinity of the Project Area. Pre-application permit review and before application agency coordination meetings or virtual coordination will occur to review proposed designs, review potential impacts and address mitigation requirements for permit application and ultimate approval.

Permitting is anticipated to take approximately six months and can be done concurrently with advancing the design to 95%.

Deliverables:

- Completed permit applications and relevant approvals.

Assumptions:

- Impacts to significant resources will not occur or are avoidable through the design development- impacts alternatives analysis process.
- It is anticipated that receipt of approved permits will require between 6 months to 12 months after submission, which will occur following the 60% design phase submission and prefinal design phase.

Activity 2.4 – Maintenance Plan

The City recognizes the complexity and need for an adaptive management design of the project in the face of changing future conditions. As such, the project team will leverage the City's future conditions modeling outputs of future water surface elevations to develop a long-term maintenance plan.

Deliverables:

- Post-Construction Monitoring and Adaptive Management Maintenance Plan

Assumptions:

- The Post Construction Monitoring and Adaptive Management-Maintenance Plan will outline long-term stability-related reviews to be performed during post-construction monitoring events. Monitoring will be performed after extreme events resulting in storm surges and high-intensity short duration runoff events resulting in potential Project Area Strom-Flood impacts. Monitoring points will be outlined in the development of the plan and Nuisance Invasive Species Management measures outlined for the Project Areas.

Objective 3 – Project Implementation

Activity 3.1 – Contractor Procurement

The project team will prepare the bid RFP, provide Bid Packages, and assist with the review of bids obtained. Any Requests for Information and bid clarifications will be addressed should they arise during the bidding process. Based upon our review of the bids, qualifications of the contractor, or identified pre-qualifications and other specification requirements included in the bid documents, the engineering consultant will assist the City in their selection of the contractor. The engineering consultant will provide a summary of the bids received, and review based upon identified selection criteria and assist the City in making the selection of the least cost-responsible bidder.

Third-party construction inspection may be required during the construction phase. The engineering consultant will provide Construction Management-Oversight Services and also

provide the required construction inspection services.

Deliverables:

- Bid Document Development, Coordination, Requests for information and Reporting
- Restoration Oversight, Management and Request for Information (RFI) Reports;
- Inspection Reports;
- Post-Construction Monitoring Reports as prescribed by permits.

Assumptions:

- It is anticipated that the bidding process, award, notice to proceed and period of construction will occur over a 12–18-month period.

Activity 3.2 – Construction

Development of construction work plan will include identification of project staging area; construction phasing sequence; and anticipated construction schedule. Construction Oversight is anticipated to occur during the Bidding, Award and Construction Phase of the project. Full-time oversight by a Rosgen-FGM Level 4 certified River Restoration designer, or as required by permit conditions, is anticipated during the six (6) month construction period. As-built plans will be developed and submitted and include permit agency coordination during the construction; additional coordination with the agencies will occur during the post-construction phases of the project.

Deliverables:

- Pre-construction survey
- Conduct weekly inspections to monitor construction progress
- Post-construction survey and as-built plans
- Post-construction baseline monitoring report

Activity 3.3 – Post-Construction Monitoring

Post-Construction Monitoring and Adaptive Management Reporting will be performed in accordance with US Army Corps of Engineers and State DEQ requirements and permitting conditions. Typical post-construction monitoring and inspections occur for three (3) years following construction.

Additional Post-Construction services, including Pollutant Reduction Plan (PRP) Credit Verification in accordance with the Chesapeake Bay Expert Panel requirements, are also identified, where PRP credits are sought under the City's MS4 permit.

Deliverables:

- Post-Construction Monitoring Reports as prescribed by permits.
- Post-construction Pollutant reduction Credit Verification and required Adaptive Management Measures.

Assumptions:

- Post-construction services will commence upon completion of restoration construction and planting and overlap-extend through the Maintenance-warranty Period of the construction phase.

b. Milestone Schedule

Our milestone schedule assumes an executed agreement date in January 2022. The expected progression of the project is shown in our milestone schedule, and notable deliverables for each milestone are listed below:

Year 1 (2022)

- *1st Quarter*
  - Project Kickoff
  - Regulatory Agency Scoping Meeting
- *2nd Quarter*
  - Data Collection Begins
- *3rd Quarter:*
  - 30% Concept Design Submission
- *4th Quarter:*
  - Data Collection Complete
  - Public Engagement Meeting

Year 2 (2023)

- *1st Quarter*
  - 60% Design Submission
  - Pre-Permitting Coordination
  - Permit Application Coordination
- *2nd Quarter*
  - Public Engagement Meeting
  - Complete Permit Application Coordination
  - Submit Permit Application
  - 95% Design PS&E

Year 3 (2024)

- *1st Quarter*
  - 100% Final PS&E
  - Submit Bid Documents
- *2nd Quarter*
  - Obtain Permit Receipt
  - Final Bid Coordination / Acceptance
  - Construction NTP, Oversight, Management, and Inspection Services
  - Begin Warranty Post Construct YR-1 Monitoring

Year 4 and Year 5 (2025/2026)

- Year-2 Post Construction Monitoring (If Required by Permit)
- Year-3 Post Construction Monitoring (If Required by Permit)

c. Potential Project Partners

The following table highlights the specific project partners, their roles, and their capabilities concerning the proposed combined project site.

Table 1: Potential Project Partners.

Entity	Role	Primary Role
Virginia Beach Department of Parks and Recreation	Integration with Park Recreational Amenities	Coordinate with the Virginia Beach Department of Public Works to incorporate recreational amenities and signage into the project design.
Virginia Beach Public Schools	Design of Interpretive and Educational Products	Coordinate with the Virginia Beach Department of Public Works to incorporate interpretive signage and educational information into the project.
Elizabeth River Project	Project Advisor	Review proposed design features, leveraging lessons learned from extensive experience from previous Elizabeth River restoration projects.
Dewberry	Engineering Contractor	Engineering consultant for design, permitting, and construction administration.
The Miles Agency	Public Education and Involvement	Coordination of the stakeholder engagement meetings, including advertising, managing check-in, and taking meeting photographs.

5. Relationship to Other Projects

As previously mentioned – this project represents the first nature-based project to advance to design and construction in implementation of the Virginia Beach Resilience Plan ("Sea Level Wise"). In addition, the City has several other planned and ongoing efforts that will work in conjunction with this project to provide flood reduction in the Elizabeth River watershed and surrounding areas.

Arrowhead Elementary School Stormwater Park

A stormwater management park was designed and constructed on the Arrowhead Elementary School property. Design features include a stormwater pond planted with aquatic plantings, native shrub buffers as well as understory and canopy native trees. The project also involved the strategic placement of nature trails to allow students access to the water. Our proposed project will build upon the educational signage and education provided by this stormwater project, utilizing the existing nature trails to provide students and visitors access to the new proposed wetland restoration project.

Stormwater Master Plan

The City Council initiated an update of our Stormwater Master Plan in 2014. This effort is interchanging information with aspects of the City's Resilience Plan to account for the impact of sea level rise on the stormwater system's performance. Specific stormwater drainage improvement projects within the Elizabeth River Drainage Basin that will complement the proposed project will be identified in the next phase (2022).

6. Maintenance Plan

A Maintenance Plan will be developed as part of this project, as described in Section 4a (Activity 3.3). The Post Construction Monitoring and Adaptive Management-Maintenance Plan will outline long-term stability-related reviews to be performed during post-construction monitoring events. Monitoring will be performed after extreme events resulting in storm surges and high-intensity short duration runoff events resulting in potential project area storm-flood impacts. Monitoring points will be outlined in the development of the plan and nuisance invasive species management measures outlined for the project site.

7. Criteria

The City has demonstrated, through this application, that the grant criteria have been met. For more details and locations of criteria, please see Table 2 below. The completed scoring criteria are included in Appendix B of this application.

Table 2: Grant criteria checklist.

Criteria	Satisfaction?
Is the applicant a local government (including counties, cities, towns, municipal corporations, authorities, districts, commissions, or political subdivisions created by the General Assembly or pursuant to the Constitution or laws of the Commonwealth, or any combination of these or a recognized state or federal Indian tribe?	Yes.
Does the local government have an approved resilience plan meeting the criteria as established by this grant manual? Has it been attached or is a link provided?	Yes. Approved on July 20, 2021. The Virginia Beach Resilience Plan ("Sea Level Wise") can be found on our website.
For local governments that are not towns, cities, or counties, have letters of support been provided from affected local governments?	Not Applicable.
Has the applicant provided evidence of an ability to provide the required match funds?	Yes. Please see *Part IV: Section D3 (Cash Funds Available)* and *Part IV: Section E3 (City Manager Approval),* for more information,
Has the applicant demonstrated to the extent possible, the positive impacts of the project or study on the prevention of flooding?	Yes. Please see *Part IV: Section B1 (Project Information)* for more details.

D: Budget Narrative

The following budget narrative details the proposed project expenditures.

1. Estimated Total Project Cost

A detailed cost breakdown for each project area is provided in the following sections. This cost breakdown is based on the 15% design concepts. Cost estimates are provided separately for Project Area 1 and Project Area 2, followed by a cost estimate for the combined project site.

Given the variable funding amounts available for "Flood Prevention and Protection Projects," the costs have been divided into Project Area 1, Project Area 2, and the combined project site to adapt to a phased approach if needed. The City intends to maximize community-scale benefits, by funding and implementing both Project Area 1 and Project Area 2 concurrently, but also understands that a phased approach may be necessary to distribute funding across CFPF grant rounds.

a. Project Area 1

The cost breakdown for Project Area 1, separated by project type, is summarized in Table 3.

Table 3: Cost breakdown for Project Area 1.

Element	Wetland Restoration & Living Shoreline	Floodplain Restoration	Element Sub-Total
Design and Permitting	$ 457,800.00	$ 568,500.00	$ 1,026,300.00
Easement Acquisition	-	$ 50,000.00	$ 50,000.00
Construction Total	$ 1,016,900.00	$ 1,256,750.00	$ 2,273,650.00
Construction and Post-Construction Management	$ 266,700.00	$ 266,700.00	$ 533,400.00
Overall Project Contingency (20%)	$ 348,280.00	$ 428,390.00	$ 776,670.00
Subtotal	**$ 2,089,680.00**	**$ 2,570,340.00**	**$ 4,660,020.00**

The total cost estimate for Project Area 1 is **$4,660,020.00**

b. Project Area 2

The cost breakdown for Project Area 2, separated by project type, is summarized in Table 4.

Table 4: Cost breakdown for Project Area 1.

Element	Wetland Restoration & Living Shoreline	Floodplain Restoration	Element Sub-Total
Design and Permitting	$ 645,600.00	$ 168,000.00	$ 813,600.00
Easement Acquisition	-	$ 20,000.00	$ 20,000.00
Construction Total	$ 1,423,800.00	$ 389,000	$ 1,812,800.00
Construction and Post-Construction Management	$ 266,700.00	$ 266,700.00	$ 533,400.00
Overall Project Contingency (20%)	$ 467,220.00	$ 168,740.00	$ 635,960.00
Subtotal	**$ 2,803,320.00**	**$ 1,012,440.00**	**$ 3,815,760.00**

The total cost estimate for Project Area 1 is **$3,815,760.00**

c. Combined Project Site (Project Areas 1 and 2)

The cost breakdown for the combined project site (Project Area 1 and 2), separated by project type, is summarized in Table 5.

Table 5: Cost breakdown for Combined Project Site.

Element	Wetland Restoration & Living Shoreline	Floodplain Restoration	Element Sub-Total
Design and Permitting	$ 1,103,400.00	$ 736,500.00	$ 1,839,900.00
Easement Acquisition*		$ 70,000.00	$ 70,000.00
Construction Total	$ 2,440,700.00	$ 1,645,750.00	$ 4,086,450.00
Construction and Post-Construction Management	$ 533,400.00	$ 533,400.00	$ 1,066,800.00
Overall Project Contingency (20%)	$ 815,500.00	$ 597,130.00	$ 1,412,630.00
Subtotal	**$ 4,893,000.00**	**$ 3,582,780.00**	**$ 8,475,780.00**

*****The majority of the proposed design features are located on City-owned property. However, temporary easement acquisition may be required (during time of construction) will likely be required for the proposed floodplain restoration features.

The total cost estimate for the project site is **8,475,780.00**

2. Funds Requested from the Fund

The City is requesting a total of **$5,933,046.00** (70% of total project cost estimate) in funding for Project Area 1 and Project Area 2, over the proposed period of performance. No support is requested for City personnel. The CFPF award will support contractual services of the engineering consultant and construction contractor to execute Activity 3.1 (Contractor Procurement), Activity 3.2 (Construction), and Activity 3.3 (Post-Construction Monitoring).

The City as prime recipient is providing a cash match of **$2,542,734.00** (30% of total project cost estimate) to cover contractual services to support Activity 1 (Stakeholder Engagement), Activity 2 (Final Design and Permitting), temporary easement acquisition costs, and all overhead direct costs related for the project.

3. Cash Funds Available

The City has $2,521,734.00 of cash on hand, contained within the City budget. This amount of cash funds is sufficient, that when combined with the potential grant funding, the City will have all necessary funds available to complete the project.

4. Funding Authorization

Please refer to *Part IV: Section E3 (City Manager Approval)*, for the documentation authorizing the funding request.

E: Supporting Documentation

1. Project maps, including:
    a. Detailed map of the project areas
    b. FIRMette of the project areas
    c. Historic flood damage data
    d. Other contextual maps to support the Scope of Work Narrative
2. Virginia Beach Resilience Plan DCR Approval
3. Authorization to request funding from the Fund from governing body or chief executive of the local government
4. City of Virginia Beach Floodplain Administrator Support Letter
5. Copy of the current Floodplain Ordinance

City of Virginia Beach Public Works

Eastern Branch Elizabeth River
Wetland and Floodplain Restoration

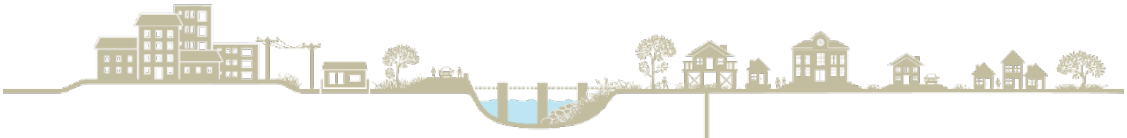
1. Project Maps

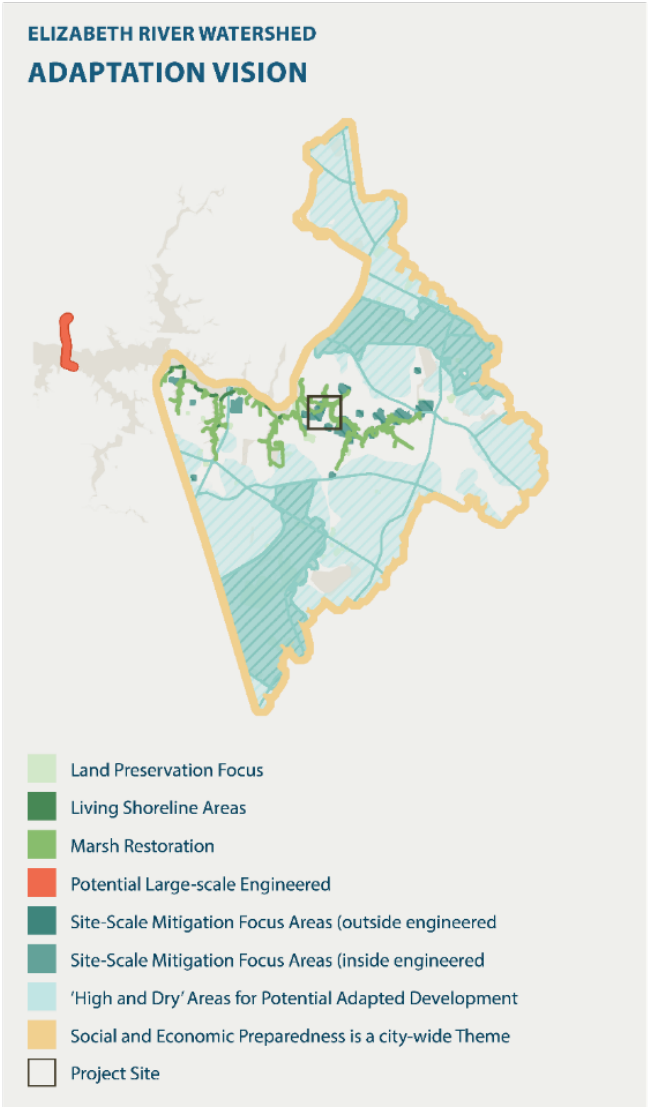
City of Virginia Beach Public Works

Eastern Branch Elizabeth River Wetland and Floodplain Restoration

a. Project Map 1: Elizabeth River Watershed Adaptation Vision

Natural and nature-based features are the primary pillar of the Elizabeth River Watershed Adaptation Strategy. Living shorelines, marsh restoration and creation, and land conservation were identified as suitable strategies along the Eastern Branch of the Elizabeth River.





Natural Mitigations
- Land Conservation
- Living Shorelines
- Marsh Restoration and Creation

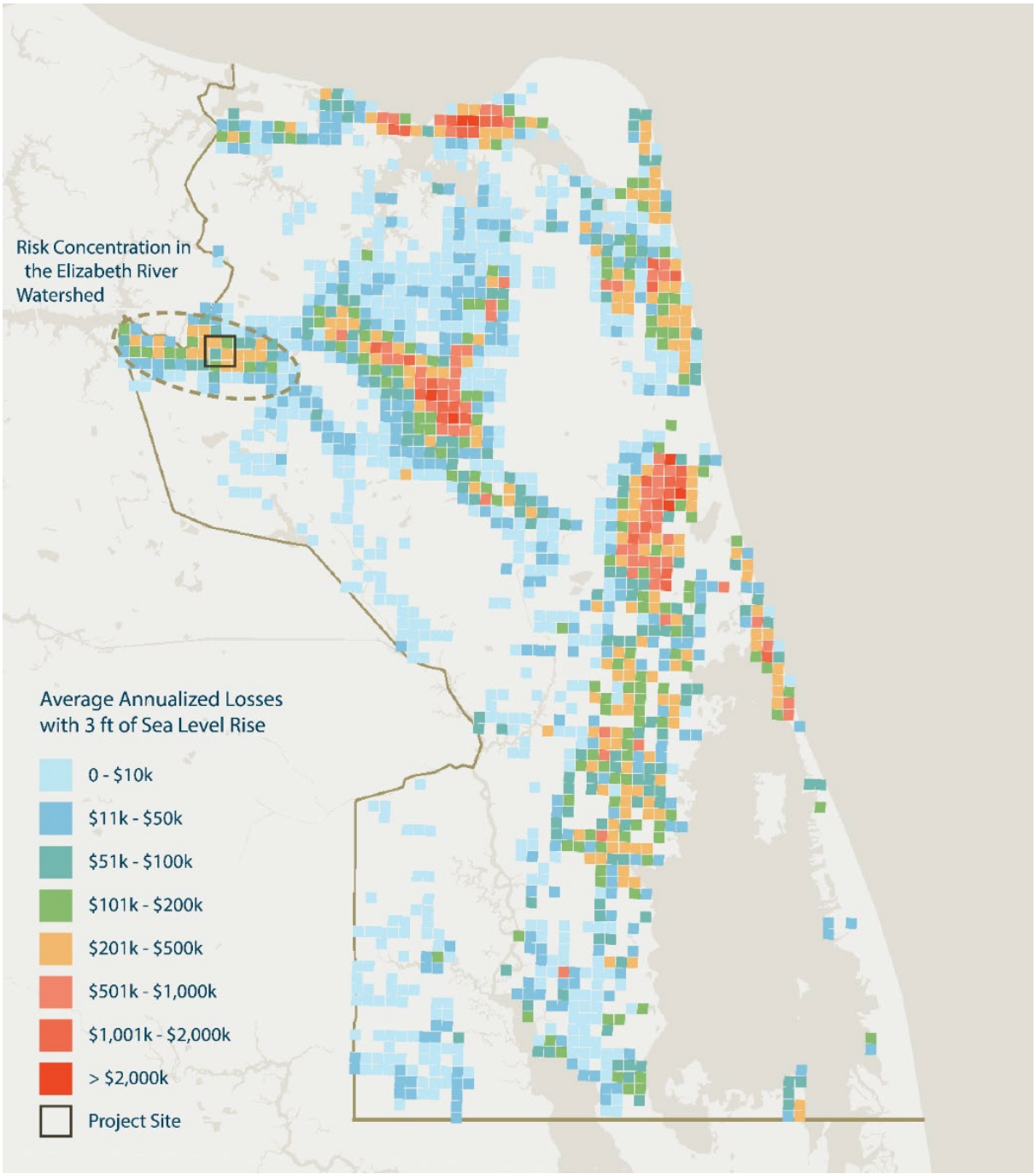
Engineered Defenses
- Elizabeth River Surge Barrier

Adapted Structures
- Building Elevation
- Commercial Floodproofing
- Floodplain Regulation
- Responsible Development
- Resilient Roadways

Prepared Communities
- Residential Community Education
- Flood Insurance Expansion
- Business Outreach and Education

b. Project Map 2: Projected Flood Losses in Project Area

Map 2 provides the projected flood losses in the proposed project area.



c. Project Map 3: Detailed Map of the Project Areas

Map 3 on the following page provides an overview of the detailed project map. The proposed project is located along the Eastern Branch of the Elizabeth River in Virginia Beach, Virginia.

Elizabeth River Pre-Concept Design (15%) Virginia Beach, Virginia

Legend

- City Property
- Street Centerline
- Living Shoreline w/ Coir Log
- Living Shoreline w/ Marsh Sill
- Step Pool Stormwater Conveyance
- Back Flow Prevention
- Stormwater Wetland
- Limit of Grading
- Wetland Restoration

PROJECT AREA 2

PROJECT AREA 1

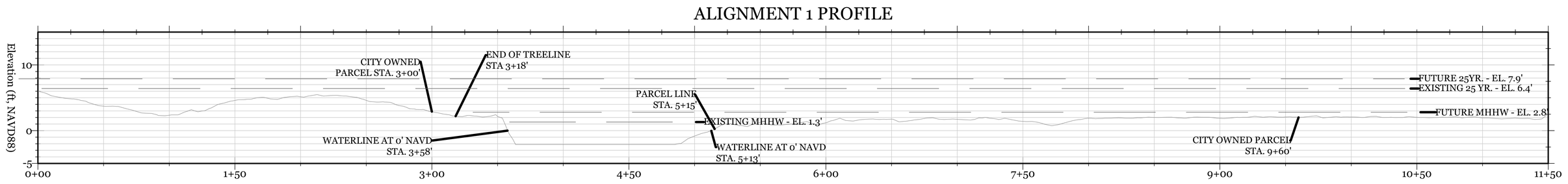
N

0 150 300 Feet

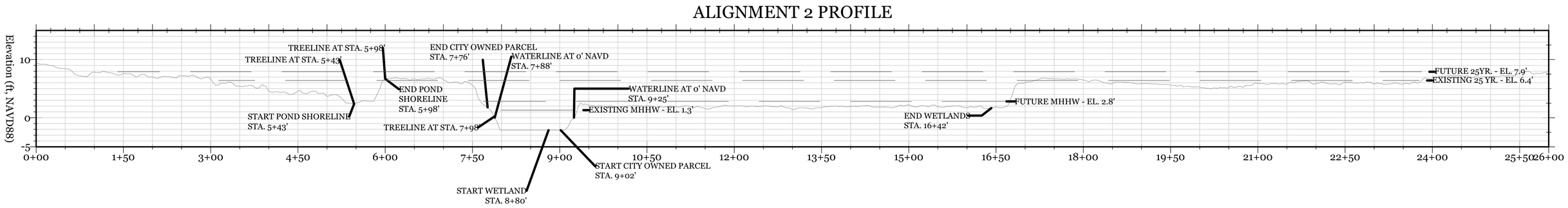
d. Project Map 4: Preliminary Design of Proposed Project

The following cross-sections contain the preliminary alignment plan. Alignment numbering corresponds to the cross-section numbering presented in Map 3.

Elizabeth River Pre-Concept Design (15%) Virginia Beach, Virginia



NOTES:
1. SCALE - 1" = 5'
2. SOURCE: VB SEAMLESS 5' DEM
3. ALL ELEVATIONS REFERENCED TO NAVD88



NOTES:
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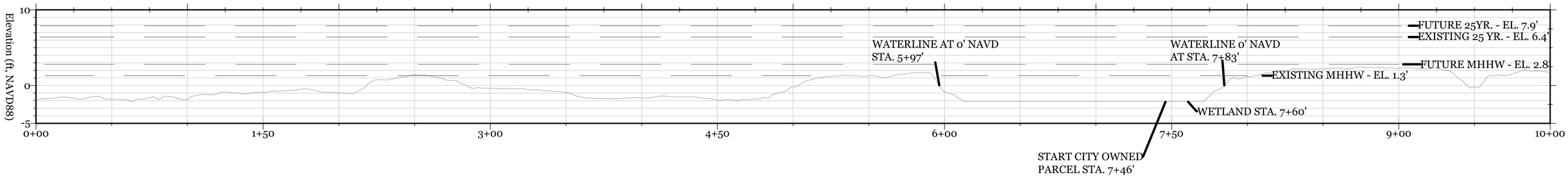
3. ALL ELEVATIONS REFERENCED TO NAVD88

Elizabeth River Pre-Concept Design (15%) Virginia Beach, Virginia

ALIGNMENT 3 PROFILE



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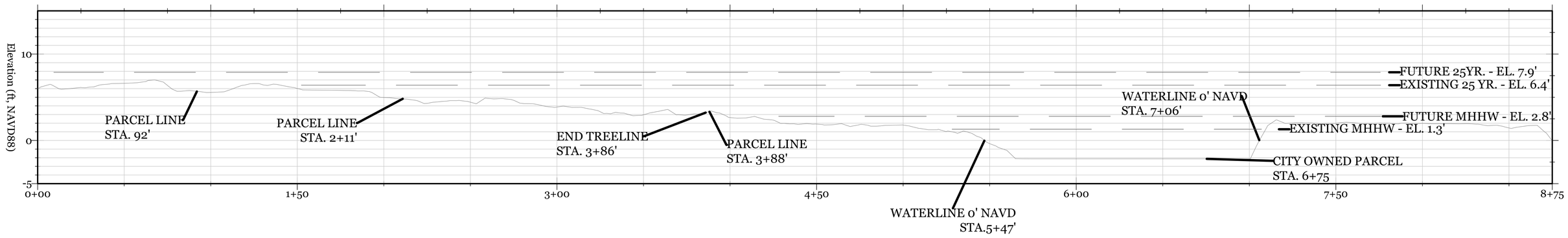
ALIGNMENT 4 PROFILE



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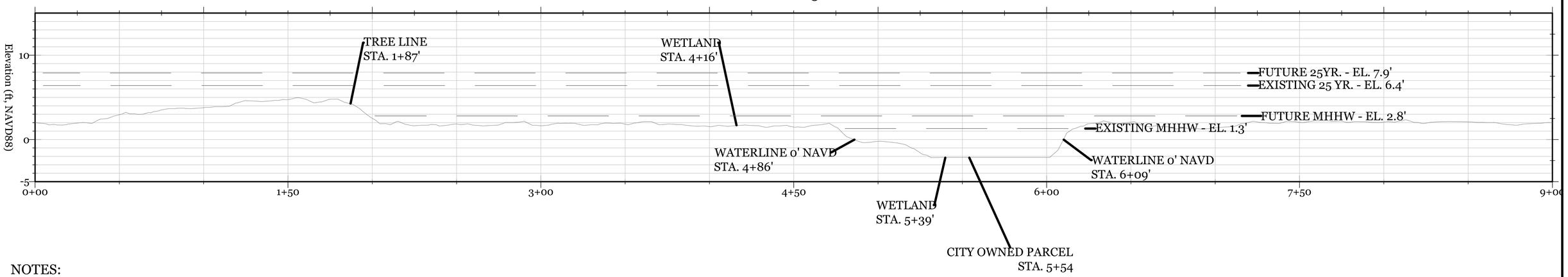
Elizabeth River Pre-Concept Design (15%) Virginia Beach, Virginia

ALIGNTMENT 5 PROFILE



NOTES:
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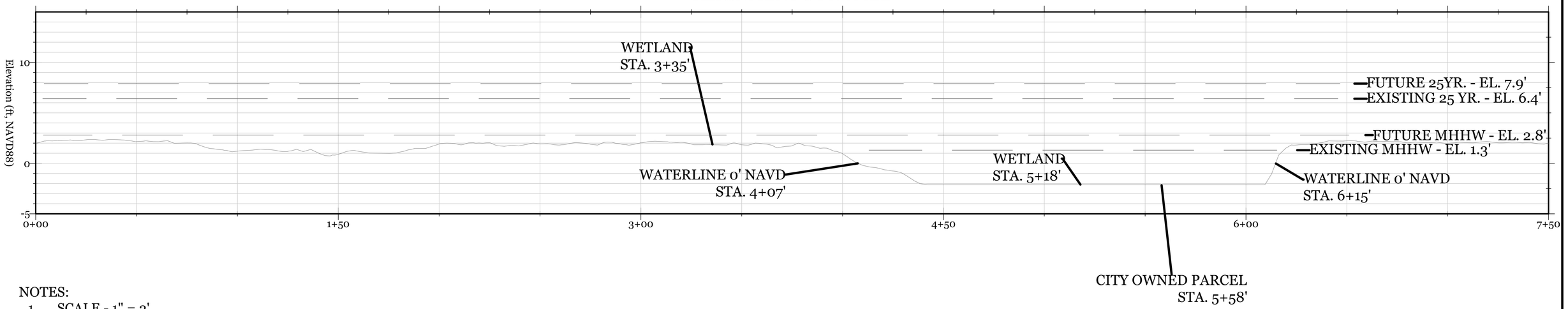
3. ALL ELEVATIONS REFERENCED TO NAVD88

ALIGNMENT 6 PROFILE



NOTES:
1. SCALE - 1" = 2'
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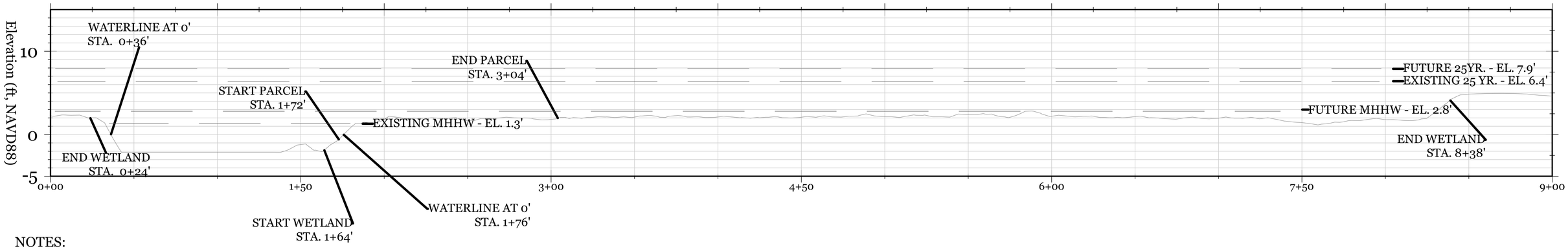
3. ALL ELEVATIONS REFERENCED TO NAVD88

Elizabeth River Pre-Concept Design (15%) Virginia Beach, Virginia

ALIGNMENT 7 PROFILE



NOTES:
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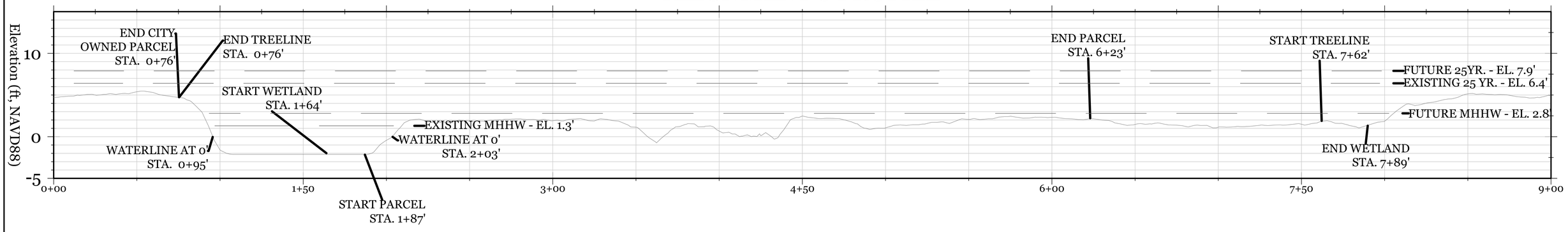
2. SOURCE: VB SEAMLESS 5' DEM
3. ALL ELEVATIONS REFERENCED TO NAVD88

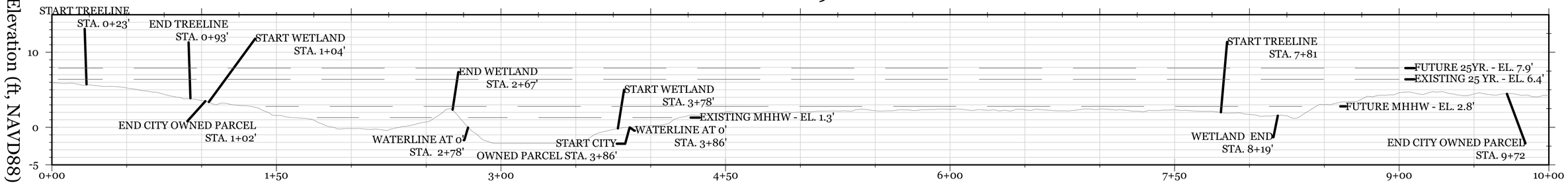
ALIGNMENT 8 PROFILE



NOTES:
1. SCALE - 1" = 2'
2. SOURCE: VB SEAMLESS 5' DEM
3. ALL ELEVATIONS REFERENCED TO NAVD88

Elizabeth River Pre-Concept Design (15%) Virginia Beach, Virginia

ALIGNMENT 9 PROFILE



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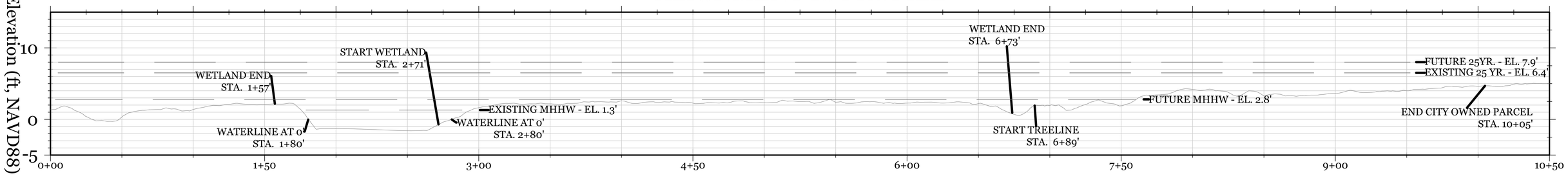
3. ALL ELEVATIONS REFERENCED TO NAVD88

ALIGNMENT 10 PROFILE



NOTES:
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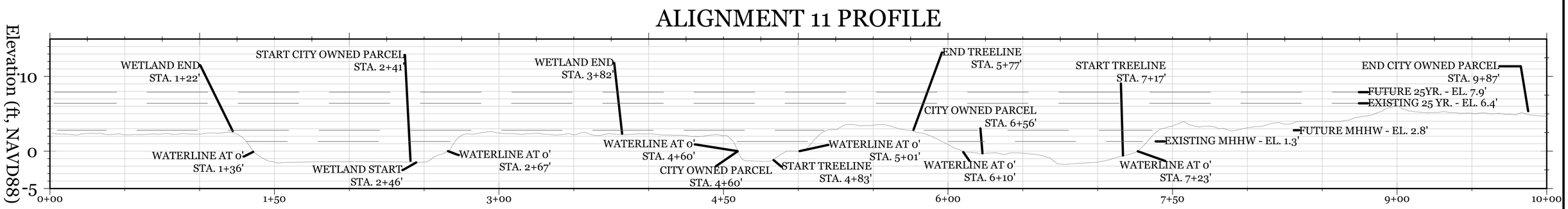
2. SOURCE: VB SEAMLESS 5' DEM
3. ALL ELEVATIONS REFERENCED TO NAVD88

Elizabeth River Pre-Concept Design (15%) Virginia Beach, Virginia

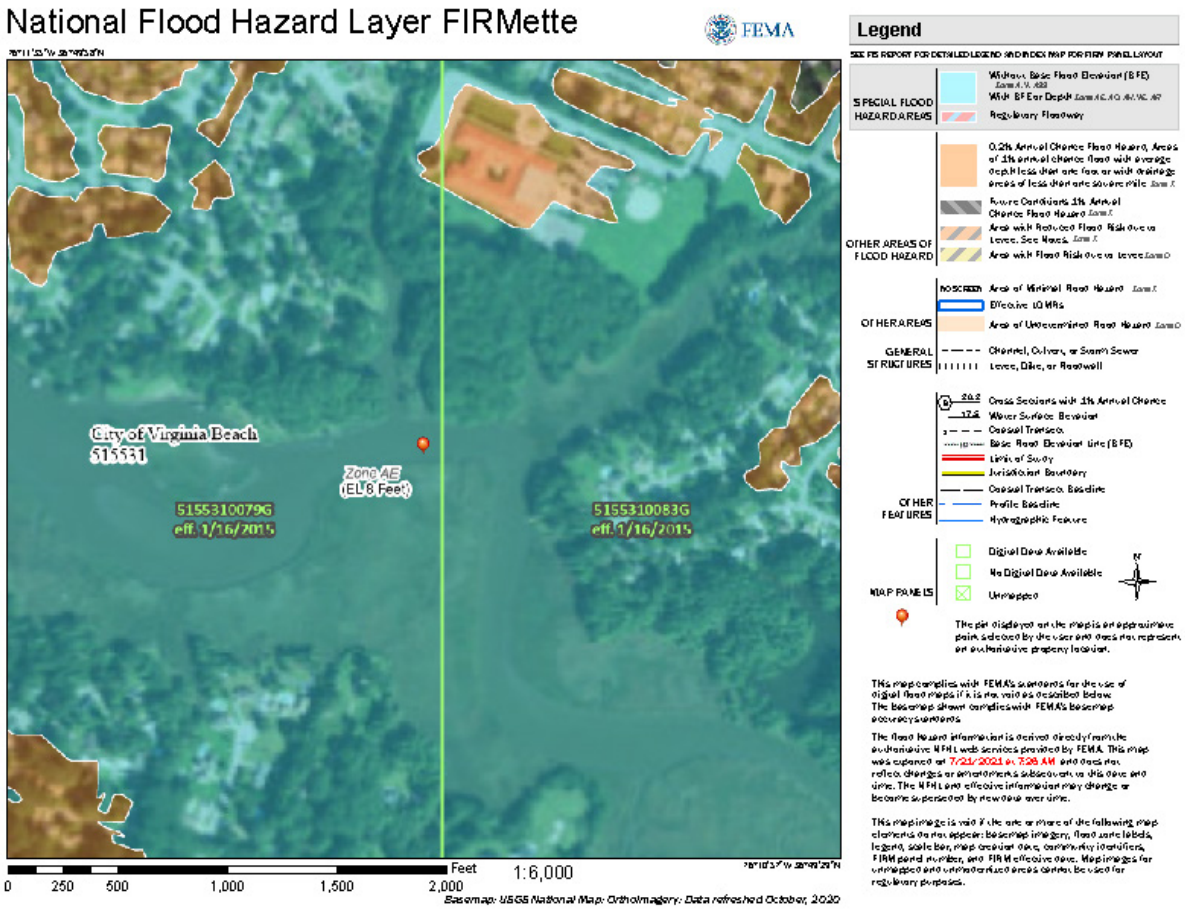


NOTES:

1. SCALE - 1" = 2'
2. SOURCE: VB SEAMLESS 5' DEM
3. ALL ELEVATIONS REFERENCED TO NAVD88

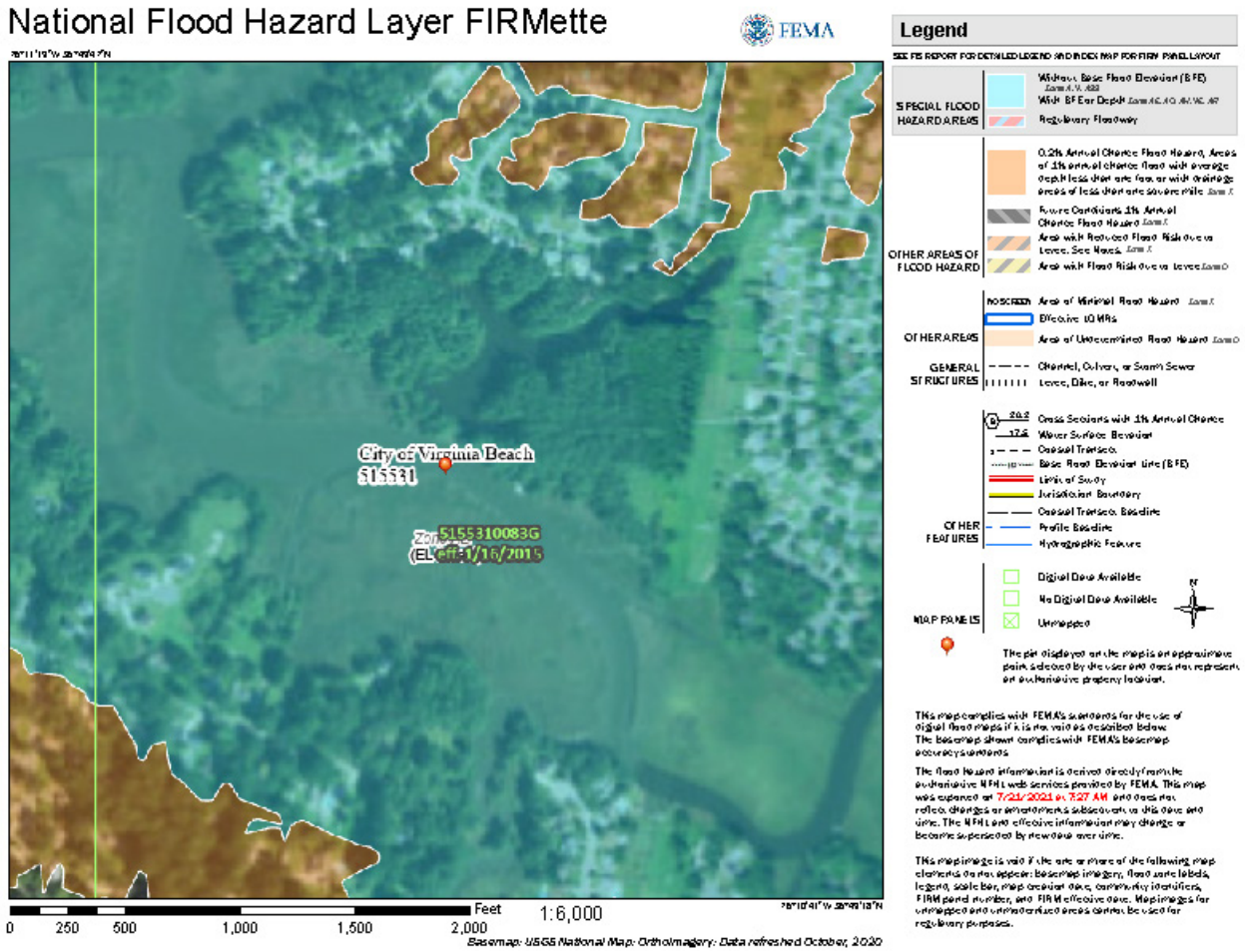
e. Project Map 5: FIRMette of the Project Areas

Map 5 provides an overview of the existing flood hazards for Project Area 1 and Project Area 2.



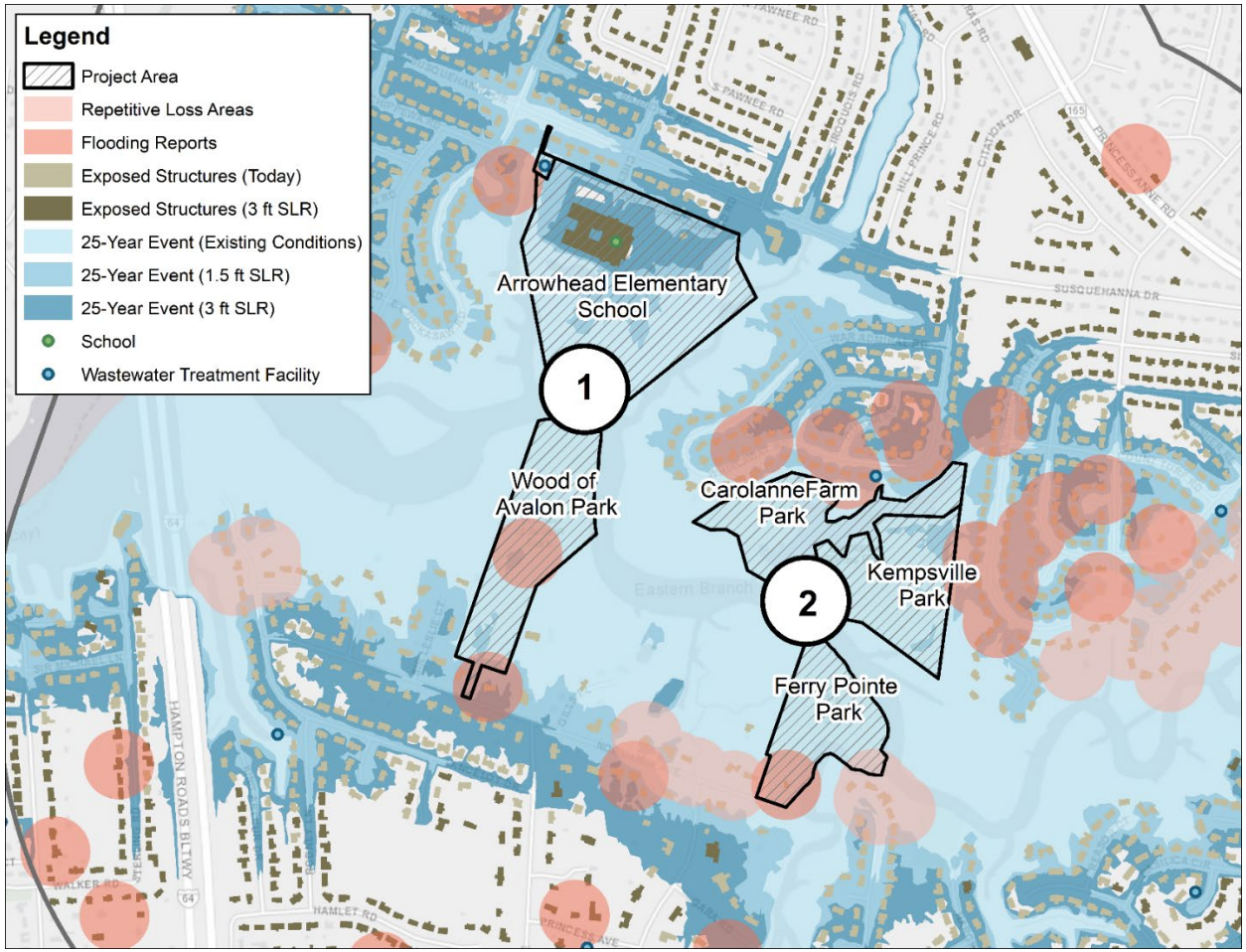
City of Virginia Beach
Public Works

Eastern Branch Elizabeth River
Wetland and Floodplain Restoration



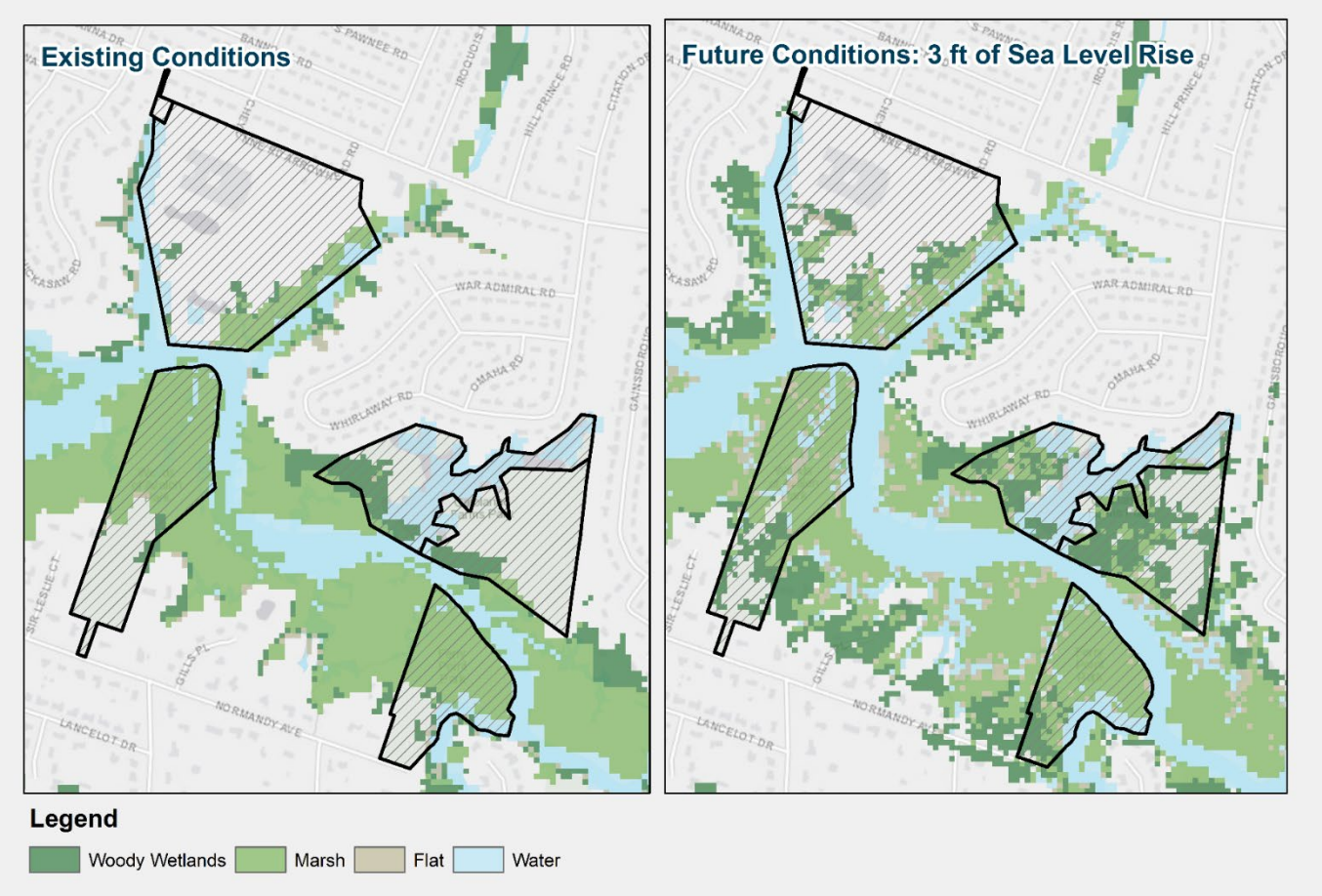
f. Project Map 6: Projected Flood Impacts within Project Areas

Map 6 highlights the potential flood impacts in and around the proposed project site.



g. Project Map 7: Projected Response of Habitat to Sea Level Rise

Map 7 provides the projected habitat response to sea level rise within the proposed project area.



2. Virginia Beach Resilience Plan DCR Approval

Matthew J. Strickler
Secretary of Natural Resources

Clyde E. Cristman
Director

COMMONWEALTH of VIRGINIA
DEPARTMENT OF CONSERVATION AND RECREATION

Rochelle Altholz
Deputy Director of Administration and Finance

Russell W. Baxter
Deputy Director of Dam Safety & Floodplain Management and Soil & Water Conservation

Nathan Burrell
Deputy Director of Government and Community Relations

Thomas L. Smith
Deputy Director of Operations

July 20, 2021

Toni Utterback, P.E.
Department of Public Works
2875 Sabre Street, Suite 250
Virginia Beach, VA 23452

RE: Virginia Beach Resilience Plan Second Submission - CFPF

Dear Ms. Utterback:

Thank you for the resubmission of the Sea Level Wise Adaptation Plan for City of Virginia Beach. After careful review and consideration, the Virginia Department of Conservation and Recreation has deemed the Plan complete and meets all the criteria outlined in the June 2021 Community Flood Preparedness Grant Manual. This approval will remain in effect for a period of three years, ending on July 31, 2024.

The following elements were evaluated as part of this review:

1. **Element 1: It is project-based with projects focused on flood control and resilience. DCR RESPONSE**

    a. Project-based: Four watersheds—each with a defined geographic area, analysis of community social and environmental characteristics, types of flooding, and a tailored flood resilience strategy with discrete projects identified.

Projects focused on flood control and resilience include:

Neighborhood	Flood Control Project
Elizabeth River	City-wide alignment, living shoreline, marsh restoration, land conservation
Lynnhaven	Chesapeake Bay alignment, Lesner Bridge Neighborhood alignment (East & West), beach & dune nourishment, ecological revetments, shellfish reef restoration, seagrass restoration
Oceanfront	Atlantic Oceanfront alignment, Rudee Heights alignment
Southern Rivers	West Neck Creek city-wide alignment, Muddy Creek Road city-wide alignment, Sandbridge city-wide alignment

**additional projects listed within the Sea Level Wise Adaptation Strategy.*

2. **Element 2: It incorporates nature-based infrastructure to the maximum extent possible. DCR RESPONSE**

a. Nature-based infrastructure: Flood mitigation projects throughout the city incorporate nature-based solutions and were identified for maximum use within specific watersheds.

3. **Element 3: It includes considerations of all parts of a locality regardless of socioeconomics or race. DCR RESPONSE**
    a. All parts of a locality: Locality divided into four watersheds, covering the entirety of the jurisdictional boundary.
    b. Social vulnerability: Social implications of flood hazards and analysis of populations at-risk documented.
    c. Demographic Analysis: Demographic and Population Vulnerability Analysis conducted by Dewberry and incorporated into the Plan.

4. **Element 4: It includes coordination with other local and inter-jurisdictional projects, plans, and activities and has a clearly articulated timeline or phasing for plan implementation. DCR RESPONSE**
    a. Coordination with other projects, plans, and activities: Contains the planning processes and frameworks which outline local and regional plans used by the City and address resilience; and how they have been integrated for flood adaptation planning.
    b. Clearly articulated timeline or phasing for plan implementation: Program phases clearly articulated and described in detail—Impact assessment, Adaptation research, Strategy development, and Long-term implementation.

5. **Element 5: Is based on the best available science, and incorporates climate change, sea level rise, storm surge (where appropriate), and current flood maps.**
    a. Technically backed water-resources analysis, sea level rise projections, storm surge, and climate change incorporated into strategic approach.

VA DCR looks forward to working with you as you work to make Virginia Beach a more resilient community. If you have questions or need additional assistance, please contact us at cfpf@dcr.virginia.gov. Again, thank you for your interest in the Community Flood Preparedness Fund.

Sincerely,

Wendy Howard Cooper, Director
Dam Safety and Floodplain Management

cc: Darryl Glover, DCR

3. Authorization to request funding from the Fund from governing body or chief executive of the local government

City of Virginia Beach

DEPARTMENT OF BUDGET AND MANAGEMENT SERVICES
(757) 385-8234
FAX (757) 385-1857

VBgov.com
MUNICIPAL CENTER
BUILDING 1
2401 COURTHOUSE DRIVE
VIRGINIA BEACH, VA 23546-9012

INTER-OFFICE MEMORANDUM

DATE: August 19, 2021

TO: Patrick Duhaney, City Manager

VIA: Ronald H. Williams, Jr., Deputy City Manager

FROM: Michael Evans, Budget & Management Analyst

SUBJECT: **Virginia Community Flood Preparedness Fund Grant – Elizabeth River**

The Department of Public Works is requesting permission to apply for the Virginia Community Flood Preparedness Fund Grant from the Virginia Department of Conservation and Recreation.

The Virginia Community Flood Preparedness Fund was established in the 2020 session of the General Assembly. Money in this fund comes from the auction of carbon allowances through the Regional Greenhouse Gas Initiative. It was established to provide support to localities across Virginia to reduce the impacts of flooding, including flooding driven by climate change.

Public Works is requesting a total of $8,475,780 to help mitigate flooding concerns on two parcels of City-owned park land along the eastern branch of the Elizabeth River, near Arrowhead Elementary School. The City has already made significant investments in studying this site and this funding will allow Public Works to implement necessary changes. This project will implement nature-based solutions that will not only address flooding concerns, abut will also help with the restoration of the Elizabeth River watershed.

This grant also requires a City match 30% for projects that implement nature-based solutions. This means that the total City match will be $2,542,734, and the award from the Commonwealth will be $5,933,046. Funding for this match will come from project 100161 "Elizabeth River Watershed."

Budget & Management Services recommends this grant application for approval. Please indicate approval or disapproval below. Applications are due by September 3, 2021.

8/19/21

Approve (Date) Disapprove (Date)

4. Virginia Beach Floodplain Administrator Support Letter

City of Virginia Beach

VBgov.com

DEPARTMENT OF PLANNING & COMMUNITY DEVELOPMENT
PHONE (757) 385-4621
FAX (757) 385-5667
VA Relay Number TTY: 711

2875 SABRE STREET, SUITE 500
VIRGINIA BEACH, VA 23452-7385

August 25, 2021

Wendy Howard Cooper
Division of Dam Safety and Floodplain Management
600 East Main Street, 24th Floor
Richmond, Virginia 23219

RE: Community Flood Preparedness Fund – Elizabeth River Restoration Project

Dear Ms.Cooper,

The proposed project is located in a Federal Emergency Management Agency (FEMA) mapped Special Flood Hazard Area (SFHA) and is considered to be an area subject to recurrent flooding. Due to the neighborhood's location along the Eastern Branch of the Elizabeth River, it is routinely impacted by storm surge flooding related to coastal storms. The proposed project encompasses three (3) Census Block Groups (Carolanne Farms, Arrowhead, and Woods of Avalon). Based on the City's most recent repetitive loss data provided by FEMA in 2020 there are twenty (20) repetitive loss properties located in these neighborhoods, with an additional three (3) repetitive loss properties located just outside these neighborhoods.

If I can provide any further information or assistance, please call me at 757-385-4621, or e-mail me at wmcnamar@vbgov.com.

Sincerely,

Whitney McNamara

Whitney McNamara, CFM
Floodplain Administrator and CRS Coordinator

5. Copy of the Current Floodplain Ordinance

ORD-3309

AN ORDINANCE TO ADOPT APPENDIX K, (FLOODPLAIN ORDINANCE) OF THE CITY CODE, PERTAINING TO FLOODPLAIN DISTRICTS, PERMITS, VARIANCE CONDITIONS AND ENFORCEMENT

Section Added: Appendix K, Floodplain Ordinance

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF VIRGINIA BEACH, VIRGINIA:

That Appendix K, Floodplain Ordinance, of the Code of the City of Virginia Beach, Virginia, is hereby adopted to read as follows:

ARTICLE I - GENERAL PROVISIONS

Sec. 1.1. Statutory authorization and purpose.

A. This ordinance is adopted pursuant to the authority granted to localities by Va. Code § 10.1 – 600 et seq.

B. The City Council finds the purpose of these provisions is to prevent the loss of life and property, the creation of health and safety hazards, the disruption of commerce and governmental services, the extraordinary and unnecessary expenditure of public funds for flood protection and relief, and the impairment of the tax base by:

1. Regulating uses, activities, and development that, alone or in combination with other existing or future uses, activities, and development, will cause unacceptable increases in flood heights, velocities, and frequencies;

2. Restricting or prohibiting certain uses, activities, and development from locating within districts subject to flooding;

3. Requiring all uses, activities, and developments that do occur in flood-prone districts be protected or flood-proofed against flooding and flood damage;

4. Protecting individuals from buying land and structures that are unsuited for intended purposes because of flood hazards; and

5. Acknowledging that the tide data over the last 100 years shows that Virginia Beach is facing an increased danger of flooding caused by both sea level rise and subsidence.

Sec. 1.2. Applicability.

These provisions shall apply to all privately and publicly owned lands within the jurisdiction of the City of Virginia Beach and identified as areas of special flood hazard according to the Flood Insurance Rate Map (FIRM) that is provided to the City of Virginia Beach by the Federal Emergency Management Agency (FEMA) and dated May 4, 2009 or identified as floodplains subject to special restrictions in Section 4.10 of this ordinance.

Sec. 1.3. Definitions.

Base flood. The flood having a one (1) percent chance of being equaled or exceeded in any given year; also referred to as the one hundred (100) year flood.

Base flood elevation. The FEMA designated one (1) percent annual chance water surface elevation. The water surface elevation of the base flood in relation to the datum specified on the City's FIRM.

Basement. Any area of the building having its floor sub-grade (below ground level) on all sides.

Breakaway wall. A wall that is not part of the structural support of the building and is intended, through its design and construction, to collapse under specific lateral loading forces without causing damage to the elevated portion of the building or the supporting foundation system.

City Council. The body designated to review appeals made by individuals with regard to decisions of the Floodplain Administrator in the interpretation of this ordinance.

City Manager. The City Manager of the City of Virginia Beach, or his designees.

Development. Any man-made change to improved or unimproved real estate, including, but not limited to, buildings or other structures, the placement of manufactured homes, streets, mining, dredging, filling, grading, paving, excavation or drilling operations, storage of equipment or materials, or the subdivision of land.

Elevated building. A non-basement building built to have the lowest floor elevated above the ground level by means of solid foundation perimeter walls, pilings, or columns (posts and piers).

Encroachment. The advance or infringement of uses, plant growth, fill, excavation, buildings, permanent structures, or development into a floodplain, which may impede or alter the flow capacity of a floodplain.

Existing construction. Structures for which the "start of construction" commenced before the effective date of the most recent FIRM (May 4, 2009) "Existing construction" may also be referred to as "existing structures."

Flood or flooding.

1. A general or temporary condition of partial or complete inundation of normally dry land areas from:

   a. The overflow of inland or tidal waters;

   b. The unusual and rapid accumulation or runoff of surface waters from any source; or

   c. Mudflows, which are proximately caused by flooding as defined in paragraph 1.b. of this definition and are akin to a river of liquid and flowing mud on the surfaces of normally dry land areas, as when earth is carried by a current of water and deposited along the path of the current.

2. The collapse or subsidence of land along the shore of a lake or other body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels or suddenly caused by an unusually high water level in a natural body of water, accompanied by a severe storm, an unanticipated force of nature such as flash flood or an abnormal tidal surge, or by some similarly unusual and unforeseeable event that results in flooding as defined in paragraph 1.a. of this definition.

Flood Insurance Rate Map (FIRM). An official map of the City, on which FEMA has delineated both the special flood hazard areas and the risk premium zones applicable to the community. A FIRM that has been made available digitally is called a Digital Flood Insurance Rate Map (DFIRM).

Flood Insurance Study (FIS). A report by FEMA that examines, evaluates, and determines flood hazards and, if appropriate, corresponding water surface elevations, or an examination, evaluation, and determination of mudflow and flood-related erosion hazards.

Floodplain. Any land area susceptible to being inundated by water from any source.

Flood proofing. Any combination of structural and non-structural additions, changes, or adjustments to structures which reduce or eliminate flood damage to real estate or improved real property, water and sanitary facilities, or structures and their contents.

Floodway. The channel of a river or other watercourse and the adjacent land areas that shall be reserved to discharge the base flood without cumulatively increasing the water surface elevation more than one (1) foot. The "floodway" may also be referred to as the "regulatory floodway".

Freeboard. A factor of safety usually expressed in feet above the base flood elevation for purposes of floodplain management. "Freeboard" tends to compensate for the many unknown factors that could contribute to flood heights greater than the height calculated for a selected size flood and floodway conditions, such as wave action, bridge openings, and the hydrological effect of urbanization in the watershed. When a freeboard is included in the height of a structure, the flood insurance premiums may be less expensive.

Highest adjacent grade. The highest natural elevation of the ground surface prior to construction next to the proposed walls of a structure.

Historic structure. Any structure that is:

1. Listed individually in the National Register of Historic Places (a listing maintained by the Department of Interior) or preliminarily determined by the Secretary of the Interior as meeting the requirements for individual listing on the National Register;

2. Certified or preliminarily determined by the Secretary of the Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined by the Secretary to qualify as a registered historic district;

3. Individually listed on a state inventory of historic places in states with historic preservation programs that have been approved by the Secretary of the Interior; or

4. Individually listed on a local inventory of historic places in communities with historic preservation programs that have been certified either:

    a. By an approved state program as determined by the Secretary of the Interior or

    b. Directly by the Secretary of the Interior in states without approved programs.

Hydrologic and Hydraulic Engineering Analysis. Analyses performed by a professional engineer licensed by the Commonwealth of Virginia, in accordance with standard engineering practices that are accepted by the Virginia Department of Conservation and Recreation and FEMA, used to determine the base flood, other

frequency floods, flood elevations, floodway information and boundaries, and flood profiles.

Letters of Map Change (LOMC). A Letter of Map Change is an official FEMA determination, by letter, that amends or revises an effective FIRM or FIS. Letters of Map Change include:

1. Letter of Map Amendment (LOMA): An amendment based on technical data showing that a property was incorrectly included in a designated Special Flood Hazard Area (SFHA). A LOMA amends the current effective FIRM and establishes that a land as defined by metes and bounds or a structure is not located in a SFHA.

2. Letter of Map Revision (LOMR): A revision based on technical data that may show changes to flood zones, flood elevations, floodplain and floodway delineations, and planimetric features. A Letter of Map Revision Based on Fill (LOMR-F) is a determination that a structure or parcel of land has been elevated by fill above the base flood elevation and is, therefore, no longer exposed to flooding associated with the base flood. In order to qualify for this determination, the fill must have been permitted and placed in accordance with the City's floodplain management ordinance.

3. Conditional Letter of Map Revision (CLOMR): A formal review and comment as to whether a proposed flood protection project or other project complies with the minimum National Flood Insurance Program (NFIP) requirements for such projects with respect to delineation of SFHAs. A CLOMR does not revise the effective FIRM or FIS.

Lowest floor. The lowest floor of the lowest enclosed area (including basement). An unfinished or flood-resistant enclosure, usable solely for parking of vehicles, building access, or storage in an area other than a basement area is not considered a building's lowest floor, provided that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirements of Federal Code 44CFR §60.3.

Manufactured home. A structure, transportable in one or more sections, that is built on a permanent chassis and is designed for use with or without a permanent foundation when connected to the required utilities. For floodplain management purposes the term "manufactured home" also includes park trailers, travel trailers, and other similar vehicles placed on a site for greater than one hundred eighty (180) consecutive days, but does not include a recreational vehicle.

Manufactured home park or subdivision. A parcel (or contiguous parcels) of land divided into two (2) or more manufactured home lots for rent or sale.

Market value. The value of a structure, established prior to the damage in question, as determined by property values used for tax assessment purposes (assessment) as adjusted by the Virginia Beach Real Estate Assessor (market factor) to reflect current market conditions, or as determined by an independent appraisal done by a professional appraiser.

New construction. For the purposes of determining insurance rates, structures for which the "start of construction" commenced on or after October 3, 1970 and includes any subsequent improvements to such structures. For floodplain management purposes, new construction means structures for which the start of construction commenced on or after the effective date of a floodplain management ordinance adopted by the City and includes any subsequent improvements to such structures.

Post-FIRM structures. A structure for which construction or substantial improvement occurred after October 3, 1970.

Pre-FIRM structures. A structure for which construction or substantial improvement occurred on or before October 3, 1970.

Recreational vehicle. A vehicle that is:

1. Built on a single chassis;

2. Four hundred (400) square feet or less when measured at the largest horizontal projection;

3. Designed to be self-propelled or permanently towable by a light duty truck; and

4. Designed primarily not for use as a permanent dwelling but as temporary living quarters for recreational camping, travel, or seasonal use.

Regulatory flood protection elevation (design flood elevation). The base flood elevation plus the freeboard required by this ordinance.

Special flood hazard area (SFHA). The land in the floodplain subject to a one (1) percent or greater chance of being flooded in any given year as set forth in this ordinance. These areas are designated as AE, AO, A, and VE on the FIRM.

Start of construction. For other than new construction and substantial improvement under the Coastal Barrier Resources Act (P.L. 97-348), means the date the building permit was issued, provided the actual start of construction, repair, reconstruction, rehabilitation, addition, placement, substantial improvement, or other improvement was within one hundred eighty (180) days of the permit date. The actual start means either the first placement of permanent construction of a structure on a site, such as the pouring of slab or footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation, or the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading, and filling; nor does it include the installation of streets and/or walkways; nor does it include excavation for a basement, footings, piers, or foundations or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main structure. For a substantial improvement, the actual start of the construction means the first alteration of any wall, ceiling, floor, or other structural part of a building, whether or not that alteration affects the external dimensions of the building.

Structure. For floodplain management purposes, a walled and roofed building, including a gas or liquid storage tank, that is principally above ground, as well as a manufactured home.

Substantial damage. Damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed fifty (50) percent of the market value of the structure before the damage occurred.

Substantial improvement. Any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds fifty (50) percent of the market value of the structure before the start of construction of the improvement. This term includes structures that have incurred substantial damage regardless of the actual repair work performed. The term does not, however, include either:

1. Any project for improvement of a structure to correct existing violations of state or local health, sanitary, or safety code specifications that have been identified by the local code enforcement official and are the minimum necessary to assure safe living conditions; or

2. Any alteration of a historic structure provided that the alteration will not preclude the structure's continued designation as a historic structure.

3. Historic structures undergoing repair or rehabilitation that would constitute a substantial improvement as defined above, shall comply with

all ordinance requirements that do not preclude the structure's continued designation as a historic structure. Documentation that a specific ordinance requirement will cause removal of the structure from the National Register of Historic Places or the State Inventory of Historic places shall be obtained from the Secretary of the Interior or the State Historic Preservation Officer. Any exemption from ordinance requirements will be the minimum necessary to preserve the historic character and design of the structure.

Violation. The failure of a structure or other development to be fully compliant with the provisions of the floodplain ordinance in effect at the time of construction or development. A structure or other development without the elevation certificate, other certifications, or other evidence of compliance required in this ordinance is presumed to be in violation until such time as that documentation is provided.

Watercourse. Any natural or artificial lake, river, creek, stream, ditch, channel, waterway, gully, ravine, swale, or wash in which water flows, either continuously, periodically, or intermittently, and which has a definite channel, bed, or banks.

Sec. 1.4. Compliance and liability.

A. No land shall hereafter be developed and no structure shall be located, relocated, constructed, reconstructed, enlarged, or structurally altered except in full compliance with the terms and provisions of this ordinance and any other applicable ordinances and regulations that apply to uses within the City.

B. The degree of flood protection sought by the provisions of this ordinance is considered reasonable for regulatory purposes and is based on acceptable engineering methods of study, but does not imply total flood protection. Larger floods may occur on rare occasions. Flood heights may be increased by man- made or natural causes, such as ice jams and bridge openings restricted by debris. This ordinance does not imply that districts outside the floodplain district or land uses permitted within such district will be free from flooding or flood damages.

C. This ordinance shall not create liability on the part of the City of Virginia Beach or any officer or employee thereof for any flood damages that result from reliance on this ordinance or any administrative decision lawfully made thereunder.

Sec. 1.5. Records.

Records of actions associated with administering this ordinance shall be kept on file and maintained by the Floodplain Administrator.

Sec. 1.6. Abrogation and greater restrictions.

This ordinance supersedes any ordinance currently in effect in the floodplain. Any ordinance, however, shall remain in full force and effect to the extent that its provisions are more restrictive.

Sec. 1.7. Severability.

If any section, subsection, paragraph, sentence, clause, or phrase of this ordinance be declared by the courts to be unconstitutional or invalid for any reason whatsoever, such decision shall not affect the validity of the ordinance as a whole other than the part so declared to be unconstitutional or invalid.

Sec. 1.8. Penalty for violations.

Any person who fails to comply with any of the requirements or provisions of this ordinance or directions of the directors of planning or public works or any authorized employee of the City of Virginia Beach shall be guilty of the appropriate violation and subject to the penalties therefore. Any violation of the provision of this ordinance shall be punishable by a fine of not more than one hundred dollars ($100.00). Each person shall be deemed guilty of a separate offense for each and every day or portion thereof during which any violation of any of the provisions of this ordinance is committed.

The Virginia Uniform Statewide Building Code (VA USBC) addresses building code violations and the associated penalties in Section 104 and Section 115.

In addition to the above penalties, all other actions are hereby reserved, including an action in equity for the proper enforcement of this ordinance. The imposition of a fine or penalty for any violation of, or noncompliance with, this ordinance shall not excuse the violation or noncompliance or permit it to continue, and all such persons shall be required to correct or remedy such violations within a reasonable time. Any structure constructed, reconstructed, enlarged, altered, or relocated in noncompliance with this ordinance may be declared by the City of Virginia Beach to be a public nuisance and abatable as such. Flood insurance may be withheld from structures constructed in violation of this ordinance.

ARTICLE II - ADMINISTRATION

Sec. 2.1. Designation of the floodplain administrator.

The City Manager of the City of Virginia Beach is hereby appointed the Floodplain Administrator to administer and implement this ordinance. The Floodplain Administrator has delegated the duties and responsibilities set forth in this ordinance to the Departments of Public Works and Planning, as specified below.

Sec. 2.2. Duties and responsibilities of the Department of Public Works.

The duties and responsibilities of the Department of Public Works shall include but are not limited to:

A. Interpreting floodplain boundaries and providing available base flood elevation and flood hazard information;

B. Verifying that applicants proposing an alteration of a watercourse have notified adjacent communities, the Department of Conservation and Recreation (Division of Dam Safety and Floodplain Management), and other appropriate agencies (Virginia Department of Environmental Quality (VADEQ), United States Army Corps of Engineers (USACE), etc.) and have submitted copies of such notifications to FEMA;

C. Advising applicants for new construction or substantial improvement of structures that are located within an area of the Coastal Barrier Resources System established by the Coastal Barrier Resources Act that Federal flood insurance is not available on such structures; areas subject to this limitation are shown on FIRMs as Coastal Barrier Resource System Areas or Otherwise Protected Areas;

D. Submitting to FEMA, or requiring applicants to submit to FEMA, data and information necessary to maintain FIRMs, including hydrologic and hydraulic engineering analyses prepared by or for the City, within six (6) months after such data and information becomes available if the analyses indicate changes in base flood elevations;

E. Maintaining and permanently keeping Flood Insurance Studies, FIRMs (including historic studies and maps and current effective studies and maps) and Letters of Map Change;

F. Notifying FEMA when the corporate boundaries of the City of Virginia Beach have been modified and:

1. Providing a map that clearly delineates the new corporate boundaries or the new area for which the authority to regulate pursuant to this ordinance has either been assumed or relinquished through annexation; and

2. If the FIRM for any annexed area includes SFHAs that have flood zones with regulatory requirements that are not set forth in this ordinance, prepare amendments to this ordinance to adopt the FIRM and appropriate requirements, and submit the amendments to the City Council for adoption; such adoption shall take place at the same time as or prior to the date of annexation and a copy of the amended ordinance shall be provided to the Department of Conservation and Recreation

(Division of Dam Safety and Floodplain Management) and FEMA.

G. Upon the request of FEMA, completing and submitting a report concerning participation in the NFIP, which may request information regarding the number of buildings in the SFHA, the number of permits issued for development in the SFHA, and the number of variances issued for development in the SFHA.

Sec. 2.3. Duties and responsibilities of the Department of Planning.

The duties and responsibilities of the Department of Planning shall include but are not limited to:

A. Reviewing applications for permits to determine whether proposed activities will be located in the SFHA;

B. Reviewing applications to determine whether proposed activities will be reasonably safe from flooding and requiring new construction and substantial improvements to meet the requirements of this ordinance;

C. Reviewing applications to determine whether all necessary permits have been obtained from the Federal, State, or local agencies from which prior or concurrent approval is required; in particular, permits from state agencies for any construction, reconstruction, repair, or alteration of a dam, reservoir, or waterway obstruction (including bridges, culverts, structures), any alteration of a watercourse, or any change of the course, current, or cross section of a stream or body of water, including any change to the SFHAs of free- flowing non-tidal waters of the State;

D. Approving applications and issuing permits to develop in flood hazard areas if the provisions of this ordinance have been met, or disapproving applications if the provisions of this ordinance have not been met;

E. Granting administrative variances pursuant to Section 6.1 of this ordinance;

F. Inspecting, or causing to be inspected, buildings, structures, and other development for which permits have been issued to determine compliance with this ordinance or to determine if non-compliance has occurred or violations have been committed;

G. Reviewing Elevation Certificates and requiring incomplete or deficient certificates to be corrected;

H. Maintaining and permanently keeping documentation supporting the issuance and denial of permits, Elevation Certificates, documentation of the elevation (in relation to the datum on the FIRM) to which structures have been flood

proofed, and other required design certifications, variances, and records of enforcement actions taken to correct violations of this ordinance;

I. Enforcing the provisions of this ordinance, investigating violations, issuing notices of violations or stop work orders, and requiring permit holders to take corrective action;

J. Advising the City Council regarding the intent of this ordinance and, for each application for a variance, preparing a staff report and recommendation; and

K. Administering the requirements related to proposed work on existing buildings:

1. Making determinations as to whether buildings and structures that are located in flood hazard areas and that are damaged by any cause have been substantially damaged; and

2. Making reasonable efforts to notify owners of substantially damaged structures of the need to obtain a permit to repair, rehabilitate, or reconstruct, and prohibit the non-compliant repair of substantially damaged buildings except for temporary emergency protective measures necessary to secure a property or stabilize a building or structure to prevent additional damage.

Sec. 2.4. Shared duties and responsibilities.

The duties and responsibilities shared by the Departments of Public Works and Planning shall include but are not limited to:

A. Undertaking, as determined appropriate by the Floodplain Administrator due to the circumstances, other actions that may include but are not limited to: issuing press releases, public service announcements, and other public information materials related to permit requests and repair of damaged structures; coordinating with other Federal, State, and local agencies to assist with substantial damage determinations; providing owners of damaged structures information related to the proper repair of damaged structures in SFHAs; and assisting property owners with documentation necessary to file claims for Increased Cost of Compliance coverage under National Flood Insurance Program (NFIP) flood insurance policies; and

B. It is the duty of the City Floodplain Administrator to take into account flood, mudslide, and flood-related erosion hazards, to the extent that they are known, in all official actions relating to land management and use throughout the entire jurisdictional area of the city, whether or not those hazards have been specifically delineated geographically (e.g., via mapping or surveying).

Sec. 2.5. Use and Interpretation of FIRMs.

The Floodplain Administrator shall make interpretations, where needed, as to the exact location of SFHAs, floodplain boundaries, and floodway boundaries. The following shall apply to the use and interpretation of FIRMs and data:

A. Where field surveyed topography indicates that adjacent ground elevations:

1. Are below the base flood elevation, even in areas not delineated as a SFHA on a FIRM, the area shall be considered a SFHA and subject to the requirements of this ordinance;

2. Are above the base flood elevation, the area shall be regulated as a SFHA unless the applicant obtains a Letter of Map Change that removes the area from the SFHA.

B. In FEMA-identified SFHAs where base flood elevation and floodway data have not been identified and in areas where FEMA has not identified SFHAs, any other flood hazard data available from a Federal, State, local or other source shall be reviewed and reasonably used.

C. Base flood elevations and designated floodway boundaries on FIRMs and in Flood Insurance Studies (FISs) shall take precedence over base flood elevations and floodway boundaries by any other sources if such sources show reduced floodway widths or lower base flood elevations.

D. Other sources of data shall be reasonably used if such sources show increased base flood elevations or larger floodway areas than are shown on FIRMs and in FISs.

E. If a Preliminary FIRM and/or a Preliminary FIS has been provided by FEMA:

1. Upon the issuance of a Letter of Final Determination by FEMA, the preliminary flood hazard data shall be used and shall replace the flood hazard data previously provided from FEMA for the purposes of administering this ordinance.

2. Prior to the issuance of a Letter of Final Determination by FEMA, the use of preliminary flood hazard data shall be deemed the best available data pursuant to Section 4.6 and used where no base flood elevations or floodway areas are provided on the effective FIRM.

3. Prior to issuance of a Letter of Final Determination by FEMA, the use of preliminary flood hazard data is permitted where the preliminary base flood elevations or floodway areas exceed the base flood elevations or designated floodway widths in existing flood hazard data provided by

FEMA. Such preliminary data may be subject to change or appeal to FEMA.

Sec. 2.6. Jurisdictional boundary changes.

A. The City floodplain ordinance in effect on the date of annexation shall remain in effect and shall be enforced by the municipality for all annexed areas. The City shall pass a resolution acknowledging and accepting responsibility for enforcing floodplain ordinance standards prior to annexation of any area containing identified flood hazards. If the FIRM for any annexed area includes SFHAs that have flood zones with regulatory requirements that are not set forth in this ordinance, the City shall prepare amendments to this ordinance to adopt the FIRM and appropriate requirements, and submit the amendments to the City Council for adoption; such adoption shall take place at the same time as or prior to the date of annexation and a copy of the amended ordinance shall be provided to the Department of Conservation and Recreation (Division of Dam Safety and Floodplain Management) and FEMA.

B. In accordance with the Code of Federal Regulations, Title 44 Subpart (B) Section 59.22 (a) (9) (v), all NFIP participating communities shall notify FEMA and, optionally, the Department of Conservation and Recreation in writing whenever the boundaries of the community have been modified by annexation or the community has otherwise assumed or no longer has authority to adopt and enforce floodplain management regulations for a particular area.

C. So that all FIRMs accurately represent the community's boundaries, a copy of a map of the community suitable for reproduction, clearly delineating the new corporate limits or new area for which the community has assumed or relinquished floodplain management regulatory authority shall be included with the notification.

Sec. 2.7. District boundary changes.

The delineation of any of the Floodplain Districts may be revised by the City of Virginia Beach where natural or man-made changes have occurred or where more detailed studies have been conducted or undertaken by the USACE or other qualified agencies, or an individual documents the need for such change. However, prior to any such change, approval shall be obtained from FEMA.

Sec. 2.8. Interpretation of district boundaries.

Initial interpretations of the boundaries of the Floodplain Districts shall be made by the Floodplain Administrator. Should a dispute arise concerning the boundaries of any of the Districts, the City Council shall make the necessary determination. The person questioning or contesting the location of the District boundary shall be given a reasonable opportunity to present his case to the City Council and to submit his own technical evidence if he so desires.

Sec. 2.9. Submitting technical data.

A community's base flood elevations may increase or decrease resulting from physical changes affecting flooding conditions. As soon as practicable, but not later than six (6) months after the date such information becomes available, a community shall notify FEMA of the changes by submitting technical or scientific data. Such a submission is necessary so that upon confirmation of those physical changes affecting flooding conditions, risk premium rates and floodplain management requirements will be based upon current data.

Sec. 2.10. Letters of map revision.

When development in the floodplain causes a change in the base flood elevation, the applicant, including state agencies, shall notify FEMA by applying for a Conditional Letter of Map Revision or a Letter of Map Revision.

Sec. 2.11. Appeals to decisions made by the Floodplain Administrator.

It is further provided that any decision of the Floodplain Administrator or his designee may be modified, reversed, or affirmed by the City Council upon appeal by any aggrieved party to such decision, if such appeal is filed with the Floodplain Administrator within thirty (30) days of such decision.

ARTICLE III - ESTABLISHMENT OF FLOODPLAIN DISTRICTS

Sec. 3.1. Description of Floodplain Districts.

A. Special Flood Hazard Areas (SFHA)

The SFHAs shall include land in the floodplain subject to a one (1) percent or greater chance of being flooded in any given year. The basis for the delineation of these districts shall be the FIS and the FIRM for the City of Virginia Beach prepared by FEMA, Federal Insurance Administration, dated May 4, 2009, and any subsequent revisions or amendments thereto.

The boundaries of the SFHAs are established as shown on the FIRM, which is declared to be a part of this ordinance and shall be kept on file at the City of Virginia Beach Department of Public Works, and include the following districts:

1. The **Floodway District** is in an **AE Zone** and is delineated, for the purposes of this ordinance, using the criterion that certain areas within the floodplain must be capable of carrying the waters of the one (1) percent annual chance flood without increasing the water surface elevation of that flood more than one (1) foot at any point. The areas included in this District are specifically defined in Table 7 of the above-referenced FIS and shown on the accompanying FIRM.

2. The **AE Zones** on the FIRM accompanying the FIS shall be those areas for which one (1) percent annual chance flood elevations have been provided and the floodway has **not** been delineated.

3. The **A Zone** on the FIRM accompanying the FIS shall be those areas for which no detailed flood profiles or elevations are provided, but the one (1) percent annual chance floodplain boundary has been approximated.

4. The **AO Zone** on the FIRM accompanying the FIS shall be those areas of shallow flooding identified as AO on the FIRM.

5. Reserved.

6. The **VE or V Zones** on FIRMs accompanying the FIS shall be those areas that are known as Coastal High Hazard areas, extending from offshore to the inland limit of a primary frontal dune along an open coast and any other area subject to high velocity wave action from storm or seismic sources.

B. Floodplain subject to special restrictions.

The City of Virginia Beach may identify and regulate local flood hazard or ponding areas that are not delineated on the FIRM. These areas are identified in Section 4.10 and may be delineated on a map using best available topographic data and locally derived information such as flood of record, historic high water marks, or approximate study methodologies.

ARTICLE IV – FLOODPLAIN DISTRICT PROVISIONS

Sec. 4.1. Permit and application requirements.

A. Permit Requirement

All uses, activities, and development occurring within any floodplain district, including placement of manufactured homes and structures, shall be undertaken only upon the issuance of the appropriate permit. Such development shall be undertaken only in strict compliance with the provisions of this Ordinance and with all other applicable codes and ordinances, as amended, such as the VA USBC and the City of Virginia Beach development ordinances. Prior to the issuance of any such permit, the Building Official shall require all applications to include compliance with all applicable state and federal laws and shall review all sites to assure they are reasonably safe from flooding. Under no circumstances shall any use, activity, or development adversely affect the capacity of the channels or floodways of any watercourse, drainage ditch, or any other drainage facility or system.

B. Site Plans and Permit Applications

All applications for development within any floodplain district and all building permits issued within the floodplain shall incorporate the following information:

1. The elevation of the base flood at the site;

2. The elevation of the lowest floor (including basement) or, in V zones, the lowest horizontal structural member;

3. For structures to be flood-proofed (non-residential only), the elevation to which the structure will be flood-proofed; and

4. Topographic information showing existing and proposed ground elevations.

Sec. 4.2. General Standards.

A. The following provisions shall apply to all permits issued in all floodplain districts:

1. New construction and substantial improvements of all structures shall be located, elevated, and constructed according to the VA USBC and anchored to prevent flotation, collapse, or lateral movement of the structure.

2. Manufactured homes shall be anchored to prevent flotation, collapse, or lateral movement. Methods of anchoring may include, but are not limited to, use of over-the-top or frame ties to ground anchors. This standard shall be in addition to and consistent with applicable state anchoring requirements for resisting wind forces.

3. New construction and substantial improvements shall be constructed with materials and utility equipment resistant to flood damage.

4. New construction or substantial improvements shall be constructed by methods and practices that minimize flood damage.

5. Electrical, heating, ventilation, plumbing, air conditioning equipment, and other service facilities, including duct work, shall be designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding.

6. New and replacement water supply systems shall be designed to minimize or eliminate infiltration of flood waters into the system.

7. New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of flood waters into the systems and discharges from the systems into flood waters.

8. On-site waste disposal systems shall be located and constructed to avoid impairment to them or contamination from them during flooding.

9. No use shall be permitted if such use will increase the amounts of potentially damaging materials, including those likely to be injurious to health, that might be transported in floods.

B. In all SFHAs, the following additional provisions shall apply:

1. Prior to any proposed alteration or relocation of any channels or of any watercourse or stream, within the City a permit shall be obtained from the USACE, VADEQ, the Virginia Marine Resources Commission, and the Wetlands Board through the joint permit application process. Furthermore, notification of the proposal shall be given by the applicant to all affected adjacent jurisdictions, the Department of Conservation and Recreation (Division of Dam Safety and Floodplain Management), other required agencies, and FEMA.

2. The flood carrying capacity within an altered or relocated portion of any watercourse shall be maintained.

3. Sand dunes, barrier beaches, and other natural protective barriers shall remain intact to provide protection against wind, waves, and erosion drainage. Any person who desires to use or alter any coastal primary sand dune, other than for the purpose of conducting the activities specified in section 1602 of the Zoning Ordinance of the City of Virginia Beach, shall first obtain a permit from the USACE, VADEQ, the Virginia Marine Resources Commission, and the Wetlands Board through the joint permit application process.

Sec. 4.3. Elevation and construction requirements.

In all SFHAs where base flood elevations have been provided in the FIS or generated by a licensed professional in accordance with Section 4.6 of this ordinance, the following provisions shall apply:

A. Residential Construction Requirements

New construction or substantial improvement of any residential structure or manufactured home in Zones AE and A with detailed base flood elevations shall have the lowest floor, including basement, elevated to a minimum of two (2) feet above the base flood level.

B. Non-Residential Construction Requirements

New construction or substantial improvement of any commercial, industrial, or non-residential building or manufactured home shall have the lowest floor, including basement, elevated a minimum of two (2) feet above the base flood level. Buildings located in AE zones may be flood-proofed in lieu of being elevated provided that all areas of the building components below the elevation corresponding to the base flood elevation plus a minimum of two (2) feet freeboard are water tight with walls substantially impermeable to the passage of water, and use structural components having the capability of resisting hydrostatic and hydrodynamic loads and the effect of buoyancy. A professional engineer or architect licensed by the Commonwealth of Virginia shall certify that the standards of this subsection are satisfied. Such certification, including the specific elevation (in relation to NAVD88) to which such structures are flood proofed, shall be maintained by the Building Official.

C. Space Below the Lowest Floor Requirements

In zones A, AE, and AO, fully enclosed areas of new construction or substantially improved existing structures that are below the regulatory flood protection elevation shall:

1. Not be designed or used for human habitation, but shall only be used for parking of vehicles, building access, or limited storage of maintenance equipment used in connection with the premises. Access to the enclosed area shall be the minimum necessary to allow for parking of vehicles (garage door), limited storage of maintenance equipment (standard exterior door), or entry to the living area (stairway or elevator).

2. Be constructed entirely of flood resistant materials below the regulatory flood protection elevation.

3. Include measures to automatically equalize hydrostatic flood forces on walls by allowing for the entry and exit of floodwaters. To meet this requirement, the openings shall either be certified by a professional engineer or architect licensed by the Commonwealth of Virginia or meet or exceed the following minimum design criteria:

   a. Provide a minimum of two (2) openings on different sides of each enclosed area subject to flooding.

   b. The total net area of all openings shall be at least one (1) square inch for each square foot of enclosed area subject to flooding.

   c. If a building has more than one (1) enclosed area, each area shall have openings to allow floodwaters to automatically enter and exit.

d. The bottom of all required openings shall be no higher than one (1) foot above the adjacent grade.

e. Openings may be equipped with screens, louvers, or other opening coverings or devices, provided they permit the automatic flow of floodwaters in both directions.

f. Foundation enclosures made of flexible skirting are not considered enclosures for regulatory purposes and, therefore, do not require openings. Masonry or wood underpinning, regardless of structural status, is considered an enclosure and requires openings as outlined above.

D. Manufactured Homes and Recreational Vehicle Requirements

1. All manufactured homes placed, or substantially improved, on individual lots or parcels must meet all the requirements for new construction, including the elevation and anchoring requirements in Article 4, section 4.2, and section 4.3 of this ordinance.

2. All recreational vehicles placed on sites shall either:

a. Be on the site for fewer than one hundred eighty (180) consecutive days; or

b. Be fully licensed and ready for highway use (a recreational vehicle is ready for highway use if it is on its wheels or jacking system, is attached to the site only by quick disconnect type utilities and security devices and has no permanently attached additions); or

c. Meet all the requirements for manufactured homes in Article 4 section 4.3(D)(1).

Sec. 4.4. Floodway requirements.

The following provisions shall apply within the Floodway District of an AE zone:

A. Within any floodway area, no encroachments, including fill, new construction, substantial improvements, or other development shall be permitted unless it has been demonstrated through hydrologic and hydraulic analysis performed in accordance with standard engineering practice that the proposed encroachment will not affect normal flood flow, result in any increase in flood levels within the community, increase erosion within or adjoining to the floodway, cause the diversion of floodwaters during the occurrence of the base flood discharge, increase peak flows or velocities in a manner likely to lead to added property damage or hazards to life, or increase the amounts of damaging materials that might be transported in floods. Hydrologic and hydraulic analyses shall be undertaken only by professional engineers or others of demonstrated

qualifications, who shall certify that the technical methods used correctly reflect currently-accepted technical concepts. Studies, analyses, computations, etc., shall be submitted in sufficient detail to allow a thorough review by the Floodplain Administrator.

Encroachments, including fill, new construction, substantial improvements, and other development within the floodway that would result in any increase in flood levels within the community during the occurrence of the base flood discharge is specifically prohibited. No variance shall be granted for any development, use, or activity that would cause any increase in the water surface elevation of the base flood.

If the above provisions are satisfied, all new construction and substantial improvements shall comply with all applicable provisions of Article 4.

B. The placement of new or replacement manufactured homes (mobile homes) is prohibited.

C. The following uses and structures may be permitted in the floodway district, subject to the requirements of Articles III, IV, V, and VI of this ordinance:

1. Public and private outdoor recreational facilities;

2. Agricultural uses, including farming, grazing, and the raising of poultry or livestock; provided, that poultry or livestock shall not be housed within five hundred (500) feet of any residential, apartment, or hotel district;

3. Open uses, such as public and private roadways, off street parking, or loading and unloading areas related to uses in adjoining districts;

4. Commercial mining, soil removal, and sand pits subject to regulations applicable to extractive industries as set forth in the conditional use provisions of the Zoning Ordinance of the City of Virginia Beach;

5. Public improvements, such as dams, levees and channel improvements, and utilities installations and substations, including temporary storage of materials, except flammable, toxic or noxious materials, and temporary location of maintenance installations; and

6. Uses and structures customarily accessory and clearly incidental and subordinate to uses listed above, including in connection with agricultural uses; roadside stands for the sale of agricultural products produced on the premises; provided that:

a. Only one (1) such stand shall be permitted per lot;

b. No such stand shall exceed five hundred (500) square feet in floor area; and

c. No such stand on the street frontage shall be erected within twenty (20) feet of the property line.

Sec. 4.5. AE Zone requirements.

The following provisions shall apply within all AE zones:

A. Until a regulatory floodway is designated, no new construction, substantial improvements or other development (including fill) shall be permitted within the areas of special flood hazard, designated as Zone AE on the FIRM, unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one (1) foot at any point within the City.

B. Notwithstanding the criteria set forth in Section 4.10, development activities in Zones AE on the City of Virginia Beach FIRM that increase the water surface elevation of the base flood by more than one (1) foot may be allowed, provided that the applicant first applies, with the City of Virginia Beach's endorsement, for a Conditional Letter of Map Revision, and receives the approval of FEMA.

Sec. 4.6. A Zone requirements.

The following provisions shall apply within an A zone:

A. For these areas, the Floodplain Administrator shall obtain, review, and reasonably utilize any base flood elevations and floodway information from federal, state, and other acceptable sources, when available. Where the specific one (1) percent annual chance flood elevation cannot be determined for this area using other sources of data, such as the USACE Floodplain Information Reports, the U.S. Geological Survey Floodprone Quadrangles, etc., then the applicant for the proposed use, development, and/or activity shall determine this base flood elevation. For development proposed in the A Zone the applicant shall use technical methods that correctly reflect currently accepted non-detailed technical concepts, such as flood hazard analyses, point on boundary, known high water marks from past floods, or detailed methodologies including hydrologic and hydraulic analyses. Studies, analyses, computations, etc., shall be submitted in sufficient detail to allow a thorough review by the Floodplain Administrator.

B. The Floodplain Administrator reserves the right to require a hydrologic and hydraulic analysis for any development and to determine the base flood elevation. When such base flood elevation data is utilized, the lowest floor shall be elevated to minimum of two (2) feet above the base flood level. During the permitting process, the Floodplain Administrator shall obtain:

1. The elevation of the lowest floor (including the basement) of all new and substantially improved structures; and

2. If the structure has been flood-proofed in accordance with the requirements of this ordinance, the elevation (in relation to NAVD88) to which the structure has been flood-proofed.

C. When the data is not available from any source, the lowest floor of the structure shall be elevated to not less than two (2) feet above the highest adjacent grade.

Sec. 4.7. AO Zone requirements.

The following provisions shall apply within an AO zone:

A. All new construction and substantial improvements of residential structures shall have the lowest floor, including basement, elevated above the highest adjacent grade an amount not less than the depth number specified in feet on the FIRM. If no flood depth number is specified, the lowest floor, including basement, shall be elevated no less than two (2) feet above the highest adjacent grade.

B. All new construction and substantial improvements of non-residential structures shall:

1. Have the lowest floor, including basement, elevated above the highest adjacent grade an amount not less than the depth number specified in feet on the FIRM. If no flood depth number is specified, the lowest floor, including basement, shall be elevated at least two (2) feet above the highest adjacent grade; or

2. Together with attendant utility and sanitary facilities be completely flood-proofed to the specified flood level so that any space below that level is watertight with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy.

C. Adequate drainage paths around structures on slopes shall be provided to guide floodwaters around and away from proposed structures.

Sec. 4.8. Reserved.

Sec. 4.9. V and VE Zone requirements.

The following provisions shall apply within V and VE Zones:

A. All new construction and substantial improvements in Zones V and VE shall be elevated on pilings or columns so that:

1. The bottom of the lowest horizontal structural member of the lowest floor (excluding the pilings or columns) is elevated to a minimum of two (2) feet above the base flood level; and

2. The pile or column foundation and structure attached thereto is anchored to resist flotation, collapse, and lateral movement due to the effects of wind and water loads acting simultaneously on all building components. Wind and water loading values shall each have a one (1) percent chance of being equaled or exceeded in any given year.

B. A professional engineer or architect licensed by the Commonwealth of Virginia shall develop or review the structural design, specifications, and plans for the construction and shall certify that the design and methods of construction to be used are in accordance with accepted standards of practice for meeting the provisions of Article IV, Section 4.6 A.

C. The Floodplain Administrator shall obtain the elevation (in relation to NAVD88) of the bottom of the lowest horizontal structural member of the lowest floor (excluding pilings and columns) of all new and substantially improved structures in Zones V and VE. The Floodplain Administrator shall maintain a record of all such information.

D. All new construction shall be located landward of the reach of mean high tide.

E. All new construction and substantial improvements shall have the space below the lowest floor either free of obstruction or constructed with non-supporting breakaway walls, open wood-lattice work, or insect screening intended to collapse under wind and water loads without causing collapse, displacement, or other structural damage to the elevated portion of the building or supporting foundation system. For the purpose of this section, a breakaway wall shall have a design safe loading resistance of not less than ten (10) and no more than twenty (20) pounds per square foot. Use of breakaway walls that exceed a design safe loading resistance of twenty (20) pounds per square foot may be permitted only if a professional engineer or architect licensed by the Commonwealth of Virginia certifies that the designs proposed meet the following conditions:

1. Breakaway wall collapse shall result from water load less than that which would occur during the base flood; and

2. The elevated portion of the building and supporting foundation system shall not be subject to collapse, displacement, or other structural damage due to the effects of wind and water loads acting simultaneously on all building components (structural and nonstructural). Maximum wind and water loading values to be used in this determination shall each

have a one (1) percent chance of being equaled or exceeded in any given year.

F. The enclosed space below the lowest floor shall be used solely for parking of vehicles, building access, or storage. Such space shall not be partitioned into multiple rooms, temperature-controlled, or used for human habitation.

G. The use of fill for structural support of buildings is prohibited. When non-structural fill is proposed in a coastal high hazard area, appropriate engineering analyses shall be conducted to evaluate the impacts of the fill prior to issuance of a development permit.

H. Existing nonconforming uses and structures located below the level of the base flood elevation, as shown in the FIS and accompanying FIRMs, shall not be expanded.

I. The man-made alteration of sand dunes, which would increase potential flood damage, is prohibited.

Sec. 4.10. Floodplain subject to special restrictions.

A. All FIRM delineated SFHAs located in the following areas shall be identified as a floodplain subject to special restrictions:

1. North Landing River and its tributaries south of Lynnhaven Parkway;

2. West Neck Creek and its tributaries south of Shipps Corner Road, London Bridge Road, and the portion of Dam Neck Road east of its intersection with London Bridge Road; and

3. Bays, creeks, lakes, guts, coves, wetlands, marshes and swamps and their tributaries comprising the Back Bay watershed south of South Birdneck Road and east of Princess Anne Road and General Booth Boulevard.

B. The following provisions shall apply within the floodplain subject to special restrictions:

1. Notwithstanding any provision of this ordinance to the contrary, no filling shall be permitted, including filling with material excavated from the same floodplain except for

a. The purpose of public roadway or other similar public works construction;

b. The maintenance**,** alteration, or relocation of bona fide agricultural ditches, swales, or agricultural pathways or those ditches required for proper lot drainage;

c. For shoreline stabilization or maintenance projects, such as riprap revetment, bulkheads, or other treatment used to stabilize and protect the banks of waterways, the City Manager or his designee may approve the placement of fill provided the following criteria are met:

i. A joint permit application is submitted;

ii. The alignment of the stabilization structure is along the escarpment or in line with adjacent stabilization structures; and

iii. Fill must be the minimum necessary to support the stabilization project.

2. The City Manager, or his designee, may approve the placement of fill provided that the following criteria are met:

a. Proposed fill within the floodplain:

i. Shall be mitigated to result in no decrease in flood storage volume on the site;

ii. Shall be mitigated entirely on the same site that will incur the fill;

iii. Shall be contiguous to the existing floodplain that is being filled; and

iv. Shall be limited to the smallest amount of area and volume possible to correct irregularities within the boundary of the project.

b. The combined areas of fill and mitigation shall not exceed five (5) percent of the total area within the floodplain located on the site that will incur the fill.

3. Residential dwelling structures shall not be located within the floodplains subject to special restrictions on lots created after October 23, 2001. Residential dwelling structures located in local flood hazard areas as of October 23, 2001 may be expanded with attached additions to a total footprint of less than one thousand (1,000) square feet; such additions shall also comply with the requirements set forth in Article V of this ordinance.

4. On lots where single family dwellings are permitted by right and which were recorded on or before October 23, 2001 and meet the requirements of section 402(b) of the City Zoning Ordinance, the minimum fill necessary shall be permitted only for the following:

a. A driveway or other on-site parking area;

b. To ensure the proper functioning of a septic system;

c. To ensure proper lot drainage given the existing and proposed development in the immediate area; and

d. To meet the VA USBC requirements for slab or crawl foundations.

Sec. 4.11. Subdivision proposal requirements.

A. All subdivision proposals shall be consistent with the need to minimize flood damage.

B. All subdivision proposals shall have public utilities and facilities such as sewer, gas, electrical, and water systems located and constructed to minimize flood damage.

C. All subdivision proposals shall have adequate drainage provided to reduce exposure to flood hazards.

D. Base flood elevation data shall be obtained from the most recent FIRM (May 4, 2009) or developed using detailed methodologies, including hydraulic and hydrologic analysis, comparable to those contained in a FIS for all final plats and other development proposals (including manufactured home parks and neighborhoods).

ARTICLE V – EXISTING STRUCTURES IN FLOODPLAIN AREAS

Sec. 5.1. Existing structures.

A structure or use of a structure or premises that lawfully existed prior to the adoption of this ordinance, but which is not in conformity with this ordinance, may be continued subject to the following conditions:

A. Any existing structures in the Floodway Area shall not be expanded or enlarged unless it has been demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practices that the proposed expansion or enlargement would not result in any increase in the base flood elevation.

B. Any modification, alteration, repair, reconstruction, or improvement of any

kind to a structure and/or use located in any floodplain areas to an extent or amount of less than fifty (50) percent of its market value shall conform to the VA USBC.

C. Any modification, alteration, repair, reconstruction, or improvement of any kind to a structure and/or use, in a floodplain area to an extent or amount of fifty (50) percent or more of its market value shall be undertaken only in full compliance with this ordinance and shall require the entire structure to conform to the VA USBC.

ARTICLE VI - VARIANCES AND APPEALS

Sec. 6.1. Administrative variances.

The Floodplain Administrator shall approve or deny an application requesting an administrative variance after receipt of a complete application. Administrative variances may only be granted for the following uses, development, or redevelopment:

A. A residential attached garage or detached garages constructed at the elevation corresponding to the base flood elevation may be flood proofed according to the requirements outlined in Section 4.3 B of this ordinance in lieu of the elevation requirements.

B. As defined in Section 4.10 Floodplains subject to special restrictions.

C. Any structure or use sustaining damage not caused by flood to an extent or amount of fifty (50) percent or more of its market value to allow the structure to be rebuilt to the freeboard height in effect at the start of construction for the original structure. If the structure is a Pre-FIRM structure, full compliance with the current VAUSBC freeboard above the base flood elevation is required. Structures that are utilizing an approved land management plan for their on-site waste disposal may be allowed to continue the use of the land management plan as long as it is approved by the City and the Health Department, even for damage or destruction resulting from flood.

Sec. 6.2. City Council variances.

A. Notwithstanding any other provision of this ordinance, the City Council shall have the authority to grant such variances from the terms of this ordinance as will not be contrary to the public interest in cases in which the strict application of the provisions of this ordinance would effectively prohibit or unreasonably restrict the use of the subject property. No variance shall be granted for any proposed use, development, or activity within any Floodway District that will cause any increase of the base flood elevation.

B. In acting upon applications for variances, the City Council shall satisfy all relevant factors and procedures specified in other sections of this ordinance and shall consider the following additional factors:

1. The danger to life and property due to increased flood heights or velocities caused by encroachments.

2. The danger that materials may be swept on to other lands or transported in floods posing the risk of injury to others.

3. The proposed water supply and sanitation systems and the ability of these systems to prevent disease, contamination, and unsanitary conditions.

4. The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owners.

5. The importance of the services provided by the proposed facility to the community.

6. The requirements of the facility for a waterfront location.

7. The availability of alternative locations not subject to flooding for the proposed use.

8. The compatibility of the proposed use with existing development and development anticipated in the foreseeable future.

9. The relationship of the proposed use to the comprehensive plan and floodplain management program for the area.

10. The safety of access by ordinary and emergency vehicles to the property in time of flood.

11. The expected heights, velocity, duration, rate of rise, and sediment transport of the flood waters expected at the site.

12. The historic nature of a structure. Variances for repair or rehabilitation of historic structures may be granted upon a determination that the proposed repair or rehabilitation will not preclude the structure's continued designation as a historic structure and the variance is the minimum necessary to preserve the historic character and design of the structure.

13. Such other factors that are relevant to the purposes of this ordinance.

Sec. 6.3. Application process.

A. Applications for variances from the requirements of this ordinance shall be made to the City Council and filed with the director of planning. The fee for such applications shall be six hundred fifty dollars ($650.00). Except in cases in which such fee is waived, the director shall not accept any application not accompanied by payment of the required fee. The procedure for the advertising, hearing and determination of applications for floodplain variances shall be in accordance with the requirements pertaining to applications for subdivision variances, as set forth in Section 9.4 of the Subdivision Ordinance. In cases in which a variance application is filed by reason of a natural disaster that is the subject of a federal declaration of emergency, application and associated advertising fees shall be waived and such application shall be given expedited processing to the maximum practical extent.

B. All applications shall be accompanied by the following:

1. A separate map, on a 1" = 100' or greater scale, identifying all proposed land disturbance, including fill and mitigation areas, and the limits of the existing and proposed SFHAs, tidal and non-tidal wetlands, Southern Watershed Management Area Buffer, and CBPA Resource Protection Area Buffer; and

2. A preliminary floodplain study addressing the physical and environmental characteristics of the floodplain located on adjoining properties and in the general area. Such study shall be sufficient to show that the variance, if granted, will meet the standards defined in Section 6.3 and in addition thereto, shall:

    a. Contain supporting data and calculations as appropriate, given the preliminary nature of the floodplain study;

    b. Comply with all applicable Public Works Specifications and Standards; and

    c. Be certified by a professional engineer, architect, surveyor, landscape architect or practitioner of a related field having a valid license issued by the Commonwealth of Virginia or who is exempt from licensure pursuant to applicable provisions of the Virginia Code.

Sec. 6.4. Requirements.

No variance shall be granted unless the following requirements are met:

A. Such variance will not create or result in:

1. Unacceptable or prohibited increases in flood heights;

2. Additional threats to public safety;

3. Extraordinary public expense;

4. Nuisances; or

5. Fraud or victimization of the public.

B. The granting of such variance will not be detrimental to other property in the vicinity.

C. The circumstances giving rise to the variance application are not of a general or recurring nature.

D. Such circumstances arise from the physical character of the property or from the use or development of adjacent property and not from the personal situation of the applicant.

E. The granting of such variance will not be in conflict with any city ordinance or regulation.

F. Variances shall be the minimum necessary to provide relief.

G. All variances shall meet all of the requirements for the Chesapeake Bay Preservation Area Ordinance (Appendix F) and the Southern Watersheds Management Ordinance (Appendix G), unless a variance therefrom is granted.

Sec. 6.5. Notification.

The Floodplain Administrator shall notify the applicant for a variance in writing that the issuance of a variance to construct a structure below the base flood elevation a) increases the risks to life and property and b) will result in increased premium rates for flood insurance.

Sec. 6.6. Records.

A record of all variance actions, including justifications for the granting of variances and notifications issued pursuant to this section shall be maintained by the Floodplain Administrator. Any variances that are issued shall be noted in the annual or biennial report submitted to FEMA.

Sec. 6.7. Appeals to variance decisions.

Appeals of decisions by the City Council under this ordinance shall be subject to review by the Circuit Court of the City of Virginia Beach, if filed within thirty (30) days from the date of City Council action.

Adopted by the Council of the City of Virginia Beach, Virginia, on the 26th day of November, 2013.