Flood Damage Reduction Project for the Huntington and Huntington Station Communities

Fairfax County, Virginia

April 2007

Purpose of Meeting

- Provide information on the project process and status and present preliminary flood damage reduction alternatives
- Involve the Huntington and Huntington Station residents and receive important and valuable feedback
- We want to know resident's issues and concerns so we can include them in the process

Agenda

- **Introductions**
- **Presentation by the U.S. Army Corps of Engineers (Corps)**
  - Summary of the June 2006 Flood Investigation
  - Project tasks completed to date
  - Tasks to be completed
  - Alternatives being evaluated
  - Questionnaire
- **Question and answer session**

June 2006 Flood Limits

- Flood elevations ranged from 12.8 to 13.9 feet

Summary of June 2006 Flood Investigation

- **Heavy rainfall on June 25th and 26th caused significant flooding along Cameron Run**
- **Cumulative impacts to the Cameron Run channel and floodplain have increased the flood levels in Huntington over time**
- **Activities that contributed to the increase in flood levels during the June event, by varying degrees**
  - Increased amounts of sedimentation (1.2 to 2 feet)
  - Route 1 interchange construction (0.5 to 0.9 feet)
  - Floodplain development (0.2 to 0.4 feet)

Flood Damage Reduction Focus Area

- **2002 VDOT 100-year floodplain in Huntington and Huntington Station Communities; elevations range from 14 to 15 feet**

Project Goals, Objectives and Opportunities

- **Goal**
  - Provide adequate flood damage reduction measures that are technically feasible and financially prudent for the safety of the Huntington and Huntington Station Communities
- **Objectives**
  - Incorporate needs/desires of the Huntington and Huntington Station Community for flood damage reduction as much as possible
  - Examine a full suite of alternatives
  - Minimize risk to the community
  - Minimize environmental impacts

Project Goals, Objectives and Opportunities (cont.)

- **Opportunities**
  - Wetland creation using dredged material (if dredging is implemented)
  - Recreational features

Project Tasks Completed

- **Identified preliminary alternatives**
  - Levees/floodwall, dredging, combination levee/floodwall and dredging, flood proofing homes and buyouts
- **Surveyed first floor and low opening elevations**
- **Corps' National Flood Proofing Team conducted site visit/inspected houses**
- **Coordinated with local, state and Federal agencies to identify data and issues**

Project Tasks Completed (cont.)

- **Collected existing conditions information:**
  - Environmental resources
  - Soils information
  - Utility information
  - Property data
- **Developed river model to determine impact of preliminary levee and dredging plans on water surface elevations**
- **Began preliminary economic analysis**

Project Tasks to be Completed

- **Develop concept designs for each of the alternative plans**
- **Determine impacts of each plan**
  - Environmental, social, aesthetic
- **Determine cost for each plan**
  - Property needed for each plan
  - Construction and design cost and future operation and maintenance costs

Project Tasks to be Completed (cont.)

- **Conduct economic analysis to determine amount of damages that would be prevented with each plan**
  - Compare economic benefits of a project versus cost to build and maintain
  - Economic benefits of a project are the reduction in flood damages and costs
  - In order for a project to meet requirements for Federal funding, economic benefits must be greater than project costs
- **At conclusion of this phase, will provide concept plans, costs and benefits to the County for their action**

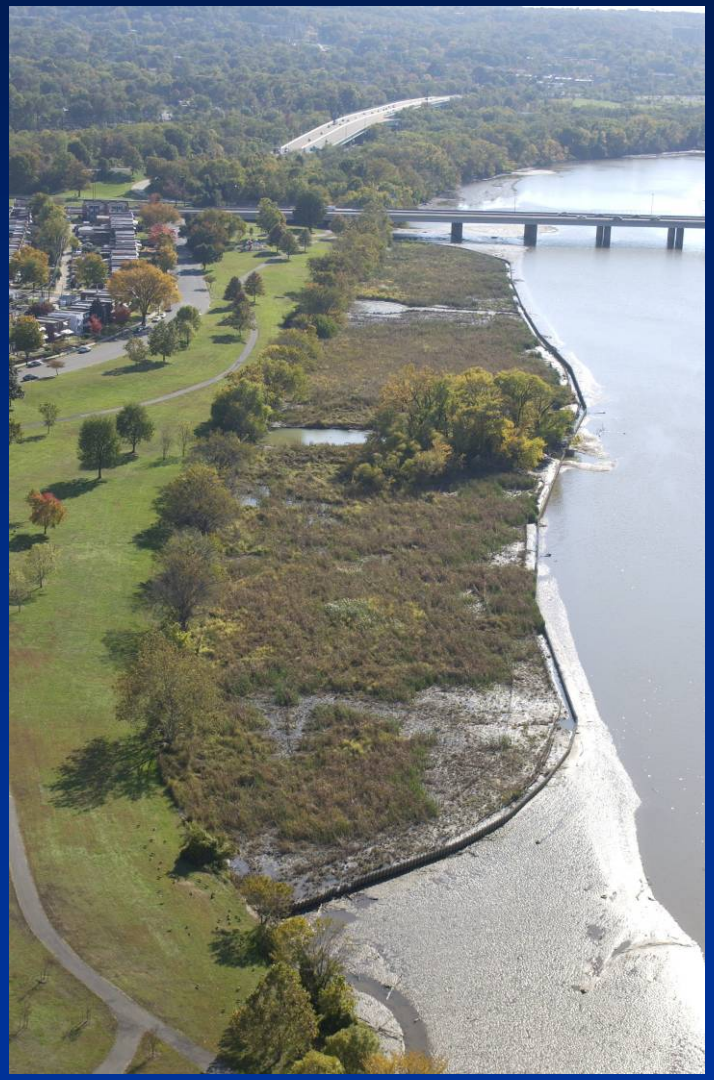
Elevation Data

- Low openings: many homes 10 to 12 feet
- First floors: many homes 12 to 14 feet
- 50-yr flood: 13 to 14 feet
- 100-yr flood: 14 to 15 feet

Preliminary Alternatives

Wetland Restoration

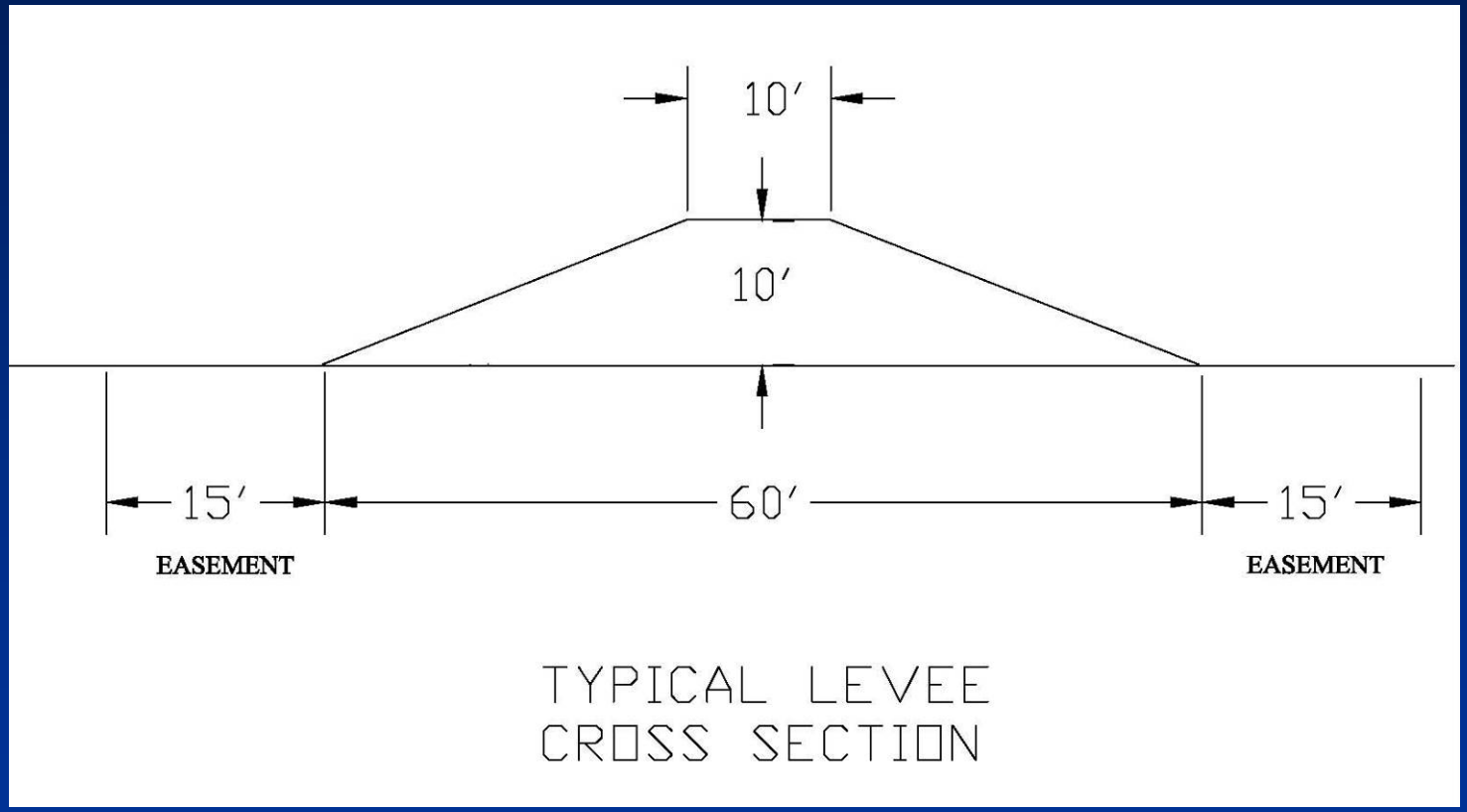
- Wetlands absorb water and can reduce water levels
- However, creating wetlands would not significantly reduce flood levels at Huntington; therefore this alternative is not being pursued further as part of this project
- The Corps, Fairfax County, and City of Alexandria are currently investigating wetland restoration as part of the Cameron Run watershed study



Levee

Potential Levee Alternative

Potential Levee Alternative



Levee

- **Earthen embankment covered with grass**
- **Provides a specific level of protection**
  - Would provide same level of protection to all homes
  - Would prevent flood damages from 100-year or 50-year flood event; based on recent modeling the June 2006 flood was considered a 50-year event
  - Depending on level of protection and where it is located, it could be ~7-10 feet high
  - If a larger flood event occurs, the levee would be overtopped and homes would flood; water would need to be pumped out
- **Protects against tidal and riverine flooding**

Levee (cont.)

- **Takes up a significant amount of space due to width**
  - Could impact the park and the ball fields (part of levee could be replaced with a flood wall, but they are typically more costly)
  - Could impact wetland areas, would avoid/minimize wherever possible
- **Aesthetics**
  - Can blend with the landscape
- **Access**
  - Could walk over and include ramp for maintenance and emergency vehicles

Levee (cont.)

- **Soils issues**
  - Poor foundation soils exist in and around area being considered for levee
  - May cost more to modify design to accommodate for poor soils
- **Impact upstream flooding**
  - Initial model runs show that a levee may increase 100-year flood levels by up to 0.8 feet upstream
- **Interior drainage issue**
  - Need to analyze rainfall on interior side of levee to determine if it will cause flooding; if so, will need to evaluate the installation of a pump station

Flood Wall

Flood Wall

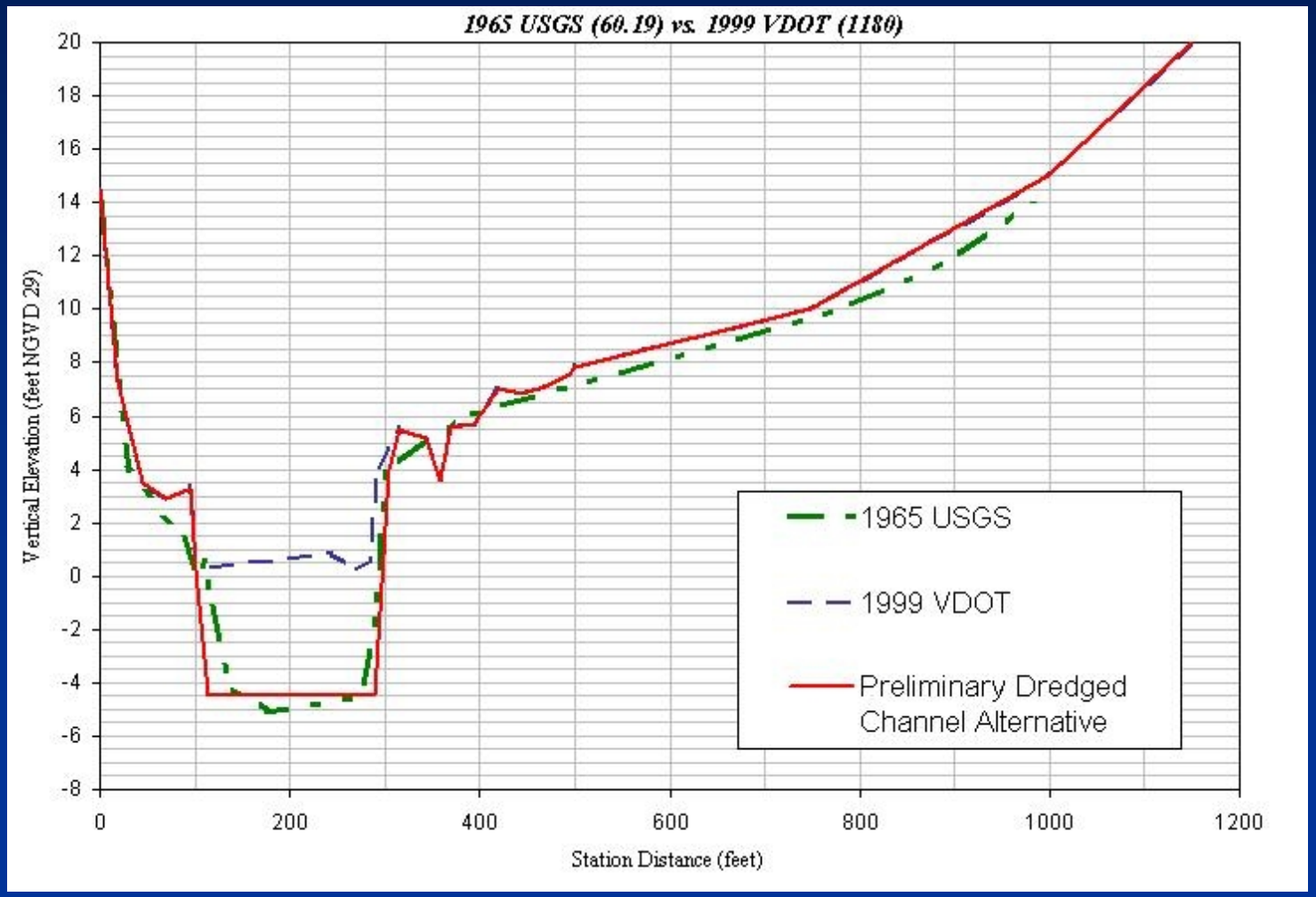
- **Typically a concrete wall**
- **Provides a specific level of protection**
- **Protects against tidal and riverine flooding**
- **Alignment**
  - Takes up less space than a levee
  - Could be constructed along similar alignment as shown for levee
- **Aesthetics**
  - More of a visual impact than a levee

Flood Wall (cont.)

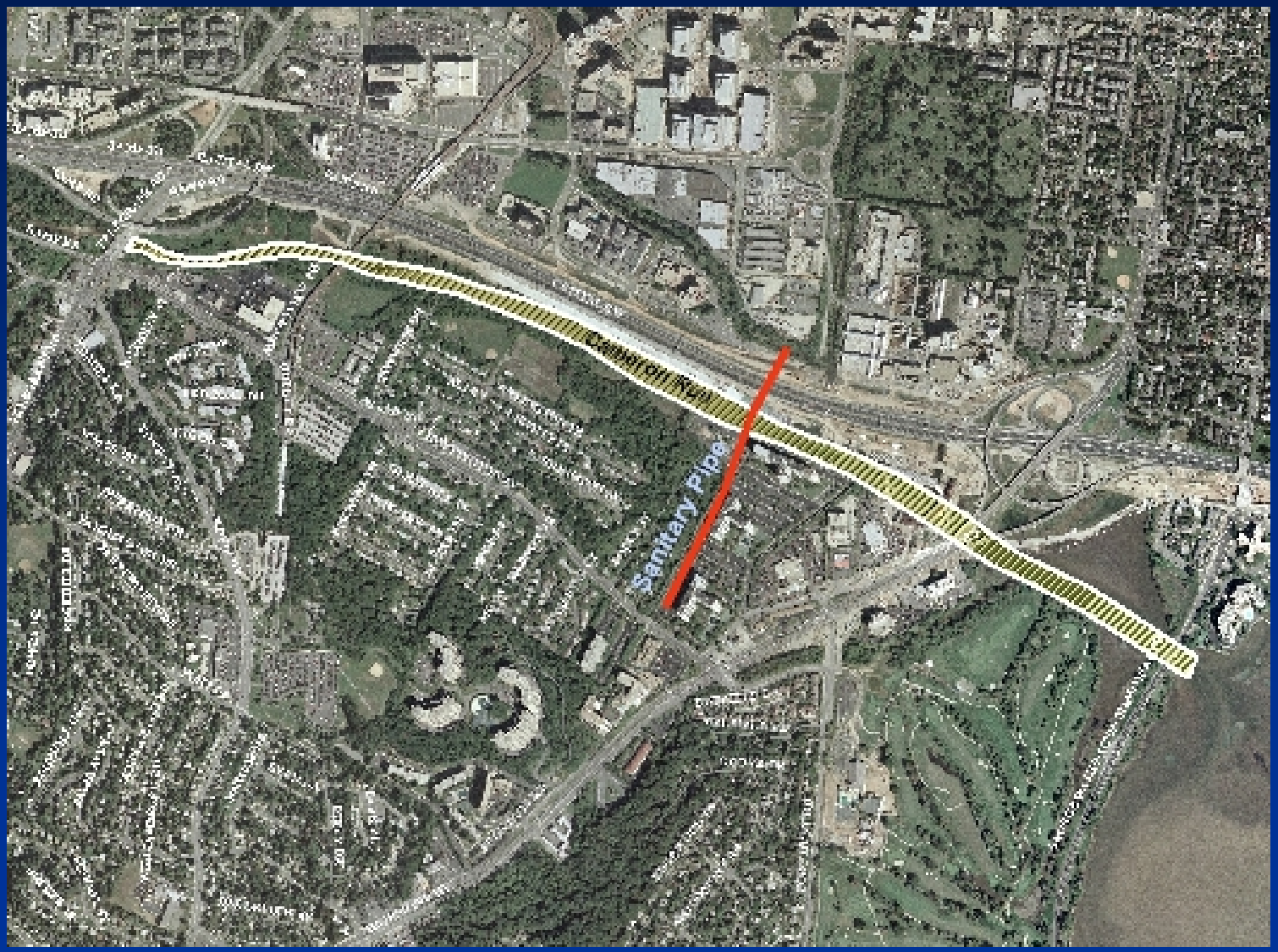
- **Access**
  - Reduces access to the river; may need a closure structure (gate)
- **Similar technical issues as a levee**
  - Poor foundation soils
  - Potential upstream impacts
  - Interior drainage; may need a pump station
- **Typically more expensive than a levee**

Potential Dredging Alternatives

- ~5 feet deep by a maximum of 200 feet wide



Dredging Alternative 1



Dredging Alternative 1

- Initial analysis shows that dredging upstream of Huntington Station will not reduce flood levels in Huntington
- Bridges and ramps downstream may limit amount of dredging

Dredging Alternative 2

Dredging Alternative 2

- **Removing sediment provides more capacity for flood water during a riverine flood event, thus it can reduce flood levels**
- **Would not reduce tidal flooding**
- **Initial analysis shows that Dredging Alternative 2 would only reduce flood levels a maximum of 1 foot at Huntington**
  - More than 150 homes would still be flooded if another June 2006 flood event occurred

Dredging Alternative 2 (cont.)

- **Would need to locate a placement site for the material (~140,000 cy of material); will be a significant challenge in this region**
- **Would need to determine how to transport the material**
  - If by truck, would require ~14,000 truckloads through the streets
- **Would need to determine frequency of dredging**
- **General Constraints**
  - Avoidance of wetlands
  - Existing sanitary pipe ~3 feet deep would have to be relocated

Buyouts

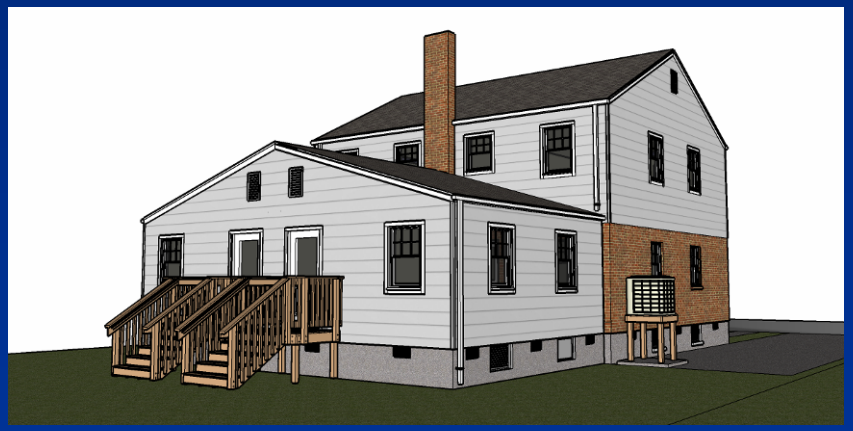
- **The government could purchase houses and restore the land back to a natural floodplain**
  - Could include wetland restoration
  - Would limit/prohibit future development
- **Property Values**
  - Would be determined using fair market value

Flood Proofing

- **Modifying individual or small groups of buildings and/or area surrounding the buildings to reduce flood damages**
  - Important analysis/design criteria
    - Flood characteristics (level, duration, and velocity)
    - Elevation of first habitable floor, type, and condition of construction, lot size, location and type of utilities, accessibility, etc.
    - Building codes, zoning/site restrictions, flood insurance guidelines, etc.
    - Owner/community input and reasonable aesthetics

Flood Proofing
Huntington – Duplexes Alternative 1
Basement Fill & Addition

- **Fill-in basement and provide addition**
- **Relocate heating/cooling equipment, water heater and electric panel to 1st floor**
- **Level of Protection**
  - existing 1st floor ~50-yr
  - Varies with each home

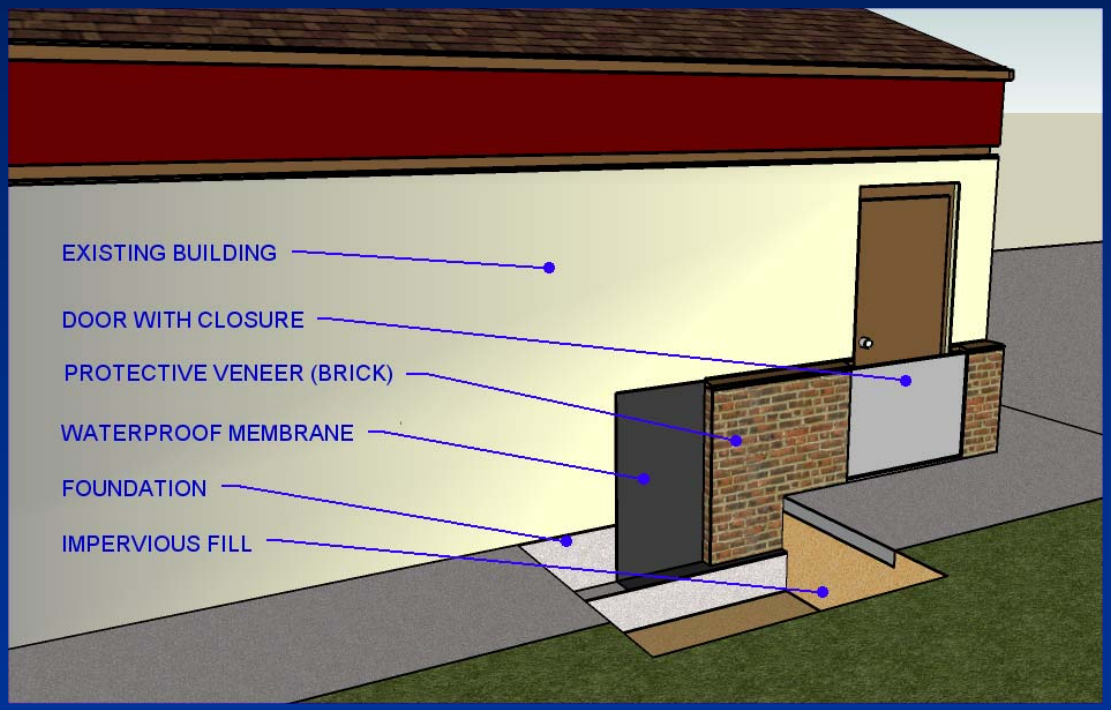


Flood Proofing
Huntington – Duplexes Alternative 2
Raise, Basement Fill & Addition

- **Raise first floor above 100-yr elevation, fill basement, and provide addition**
- **Relocate heating/cooling equipment, water heater and electric panel to 1st floor**
- **Level of Protection**
  - 100-yr + 18 inches

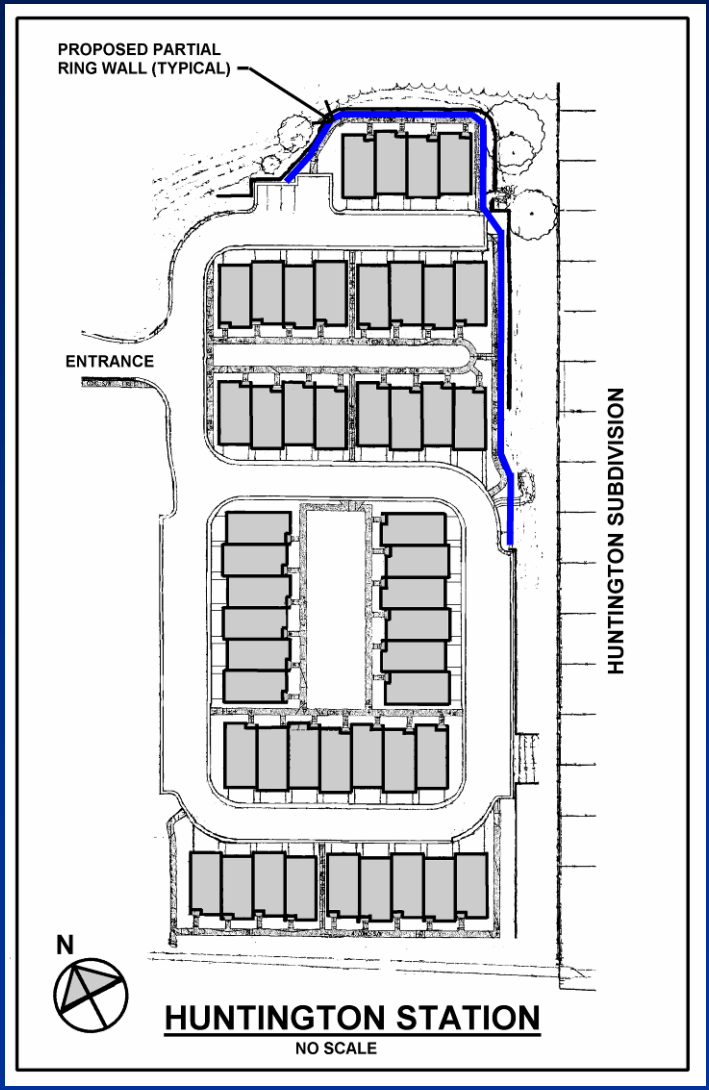
Flood Proofing
Huntington - Community Center
(Veneer Wall)

- **Waterproof membrane applied to exterior of existing wall with protective covering**
- **Interior sump pumps with emergency power**
- **Closures at all openings (must be manually closed)**
- **Level of Protection**
  - 100-yr + 18 inches



Flood Proofing
Huntington Station - Town Houses

- **Construct partial ring wall at northeast corner of site tied into high ground**
  - Low masonry or concrete wall
  - Modify interior drainage
  - Modify stormwater and sanitary sewer to prevent backflow of flooded systems
  - Pumps with emergency power



Flood Proofing
Items of Consideration

- Voluntary program
- Dual ownership requires neighbors to work together
- Occupant/Community impact during construction
- Other structures, vehicles, infrastructure, etc. are not protected
- Evacuate - Structure should not be occupied during flood event

Flood Proofing Team Findings/Tips

- A number of houses had plywood or other materials closing off the windows to try to keep flood waters from entering the basements. Be aware that there is a risk that blocking off the windows could potentially cause more damage to the structure due to the significant water pressure against the walls
- Recommend moving any critical and valuable items from the basement or the first floor (documents, old photographs, computer, etc.)

Flood Proofing Team Findings/Tips (cont.)

- Consider elevating new utilities when they are being installed since they are expensive to replace (hot water heater, air conditioning/heating unit)
- Consider installing a backflow preventer on the sewer line
- If a flood was to occur again, pump out the water slowly from your house to avoid structural damage

Wrap-Up

- **Provided you information on the preliminary alternative solutions we are evaluating**
- **Schedule**
  - Newsletter mailed to community following tonight's meeting
  - Checkpoint with County for preliminary review/screening of alternatives this summer
  - Anticipate providing the County with concept designs, costs, and impacts of alternatives by the end of the year
- **Questionnaire**
  - Your opinions are important to us
  - Questionnaire that we would like for you to fill out
    - You may also complete online through the County's website at: http://www.fairfaxcounty.gov/dpwes/stormwater/floodreport.htm

Points of Contact

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Questions?