Public Meeting

Belle View/New Alexandria/River Towers

Flood Risk Management Study
Status Update

October 25, 2012

Purposes of Meeting

- Review the Belle View/New Alexandria/River Towers flood risk management study
- Initiate a discussion with residents about the alignment of a flood wall/levee
- Start to create consensus among residents about the best location of the proposed floodwall/levee

Agenda

- Welcome
- Presentation by the U.S. Army Corps of Engineers (Corps)
- Question/Answers and Feedback
- Final Steps

Communities are at Risk of Flooding

1% Annual Chance Floodplain* Based on Storm Surge Elevation 11.2 ft (NGVD29)

***1% annual chance flood is the flood that has a 1% chance of occurring in any given year, sometimes referred to as the 100-year flood**

Flood Inundation Areas to Elev. 14 Ft.

- Sea Level Rise will increase chance of flooding
- Floods higher than the 1% chance flood DO occur

Elevation Data

- Many low openings/first floors: elevation 6-11 feet
- Majority of ground elevation is 8-9 feet in Belle View, 4-9 feet in New Alexandria
- 2% annual chance (50 year/Hurricane Isabel) storm surge: 9.6 feet
- 1% annual chance (100 year) storm surge: 11.2 feet
- 0.2% annual chance (500 year) storm surge: 16.2 feet

Previous Study

- **Completed Feb 2008 – Flood Damage Reduction Analysis for Belle Haven Watershed (*by Corps*)**
  - Fairfax County requested that Corps conduct a study to evaluate various flood damage reduction alternatives to determine if they are technically feasible
  - Conducted under technical services program; was not a Corps project study authorized by Congress
  - County asked Corps to conduct preliminary economic analysis to determine if a project might meet the federal economic justification requirements
  - Evaluated alternatives to protect entire study area, and New Alexandria/Belle View independently

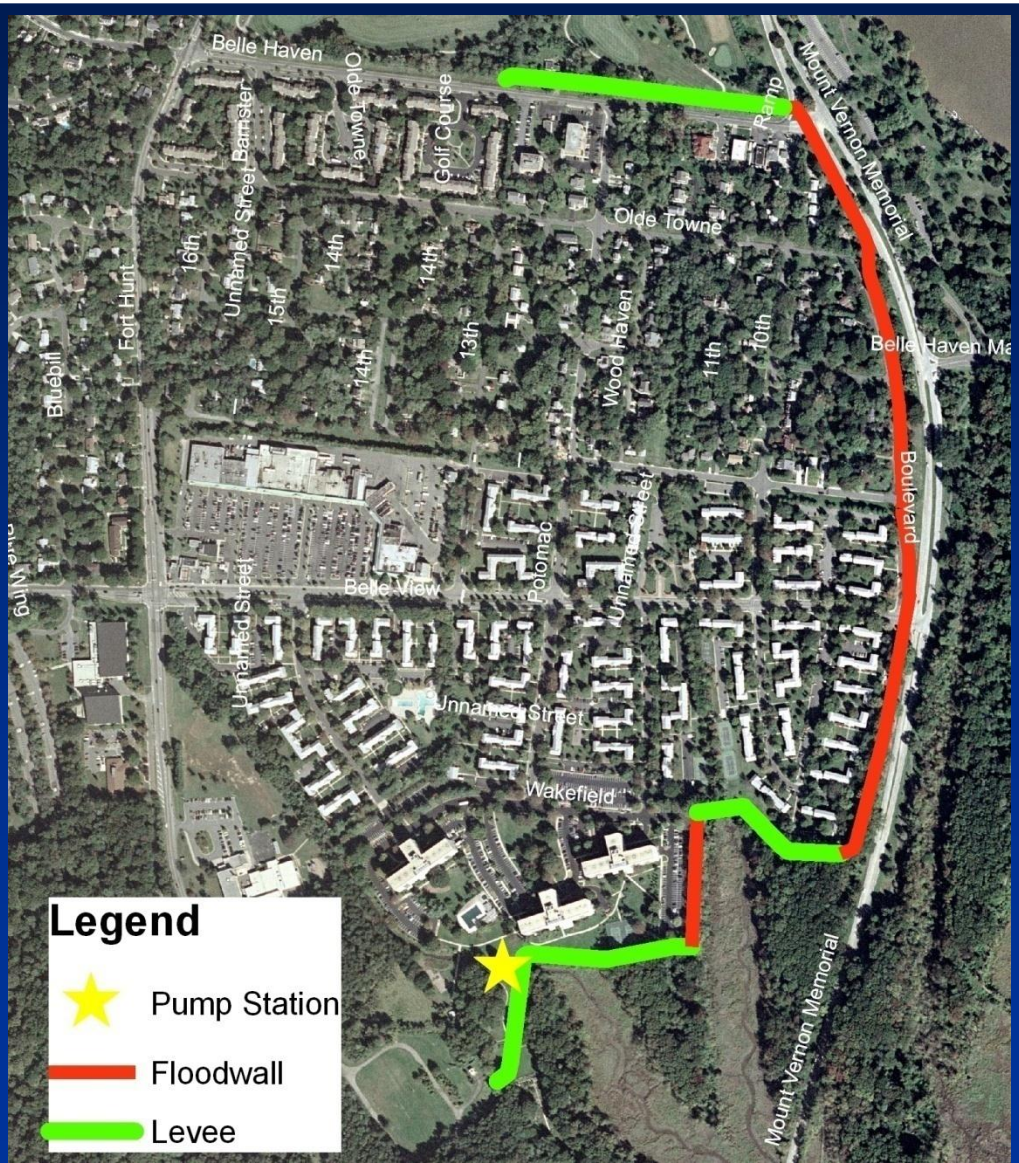
Project Goals and Objectives

- **Goal**
  - Provide adequate flood risk management measures that are technically feasible and financially prudent for the safety of communities
- **Objectives**
  - Examine various alternatives for reducing flood risk and damages – primarily from storm surge
  - Minimize risk to the community
  - Minimize environmental impacts
  - Incorporate needs/desires of the communities to the degree possible

2008 Study - Most Cost Effective, Plan 1b

- Preliminary concept plan assumed top of levee/floodwall at elevation 12.0’ (0.8’ above 1% annual chance elevation; no risk and uncertainty analysis was conducted; cannot say will provide “100-year protection” and no sea level rise considered)
- Approx. 6600 feet long; 4-6 feet above ground

Plan 1b (2008 Study) - Levee/Floodwall Alternative



Plan 1b (cont.)

- **Requires 2 closure structures – along Belle Haven Road and Belle View Blvd**
- **Minimizes impacts to wetlands**
- **Impacts many trees**
- **Is partially located on NPS and River Towers property**
- **Requires 1 pumping station**
- **Estimated costs Plan 1b - Levee/Wall 12'**
  - Construction Cost = $12.7M
  - Benefit to Cost Ratio (BCR) = 2.5
  - Current cost and BCR: $13.7M and 2.2

NPS Concerns Regarding Plan 1b

- Impact to GW Memorial Parkway
- Impact to trees
- Impact to view/aesthetics
- Would prefer project to be off their property (if on federal property, need NEPA process, Congressional authorization, etc.)

River Towers Concerns Regarding Plan 1b

- Impacts to Dykes Marsh
- Impacts to River Towers property
- Impacts to view/aesthetics
- Impact of pump station on their property
- Requested that the project be moved off their property

Community Concerns Regarding Plan 1b

- Impacts to view/aesthetics & trees
- Impacts to Dyke Marsh
- Impacts to private property
- Level of protection & want it to fix the problem
- FEMA certification & the need for insurance
- Global warming/sea level rise
- Environmental impacts

Study Progress

- **2009 – County conducted field survey and tree survey for study**

- **2010 – 2012 – Development and evaluation of new alternatives**
  - Team identified various new alignments
  - Coordinated alignments with NPS and made revisions
  - Investigated portable flood barriers
  - Developed concept plans, costs and benefits for the new plans
  - Completed a preliminary sea level rise analysis
  - Coordinated with community leaders

Previous and New/Modified Floodwall/Levee Alignments

Height of Protection Overview

- **1% annual chance flood elevation (100-yr elevation based on storm surge) = 11.2 feet**
- **FEMA - for certification of project (no flood insurance requirement), FEMA requires the project be 3 feet higher than the 1% annual chance elevation = 14.2 feet**
- **CORPS – for Corps built projects, wall must be built higher than the design event to account for risk and uncertainty (varies per project, but for the 1% annual chance flood design, typically 3-4 feet higher than the 1% annual chance flood elevation) plus sea level rise must be considered = 14.2-15.2 feet + SLR consideration**

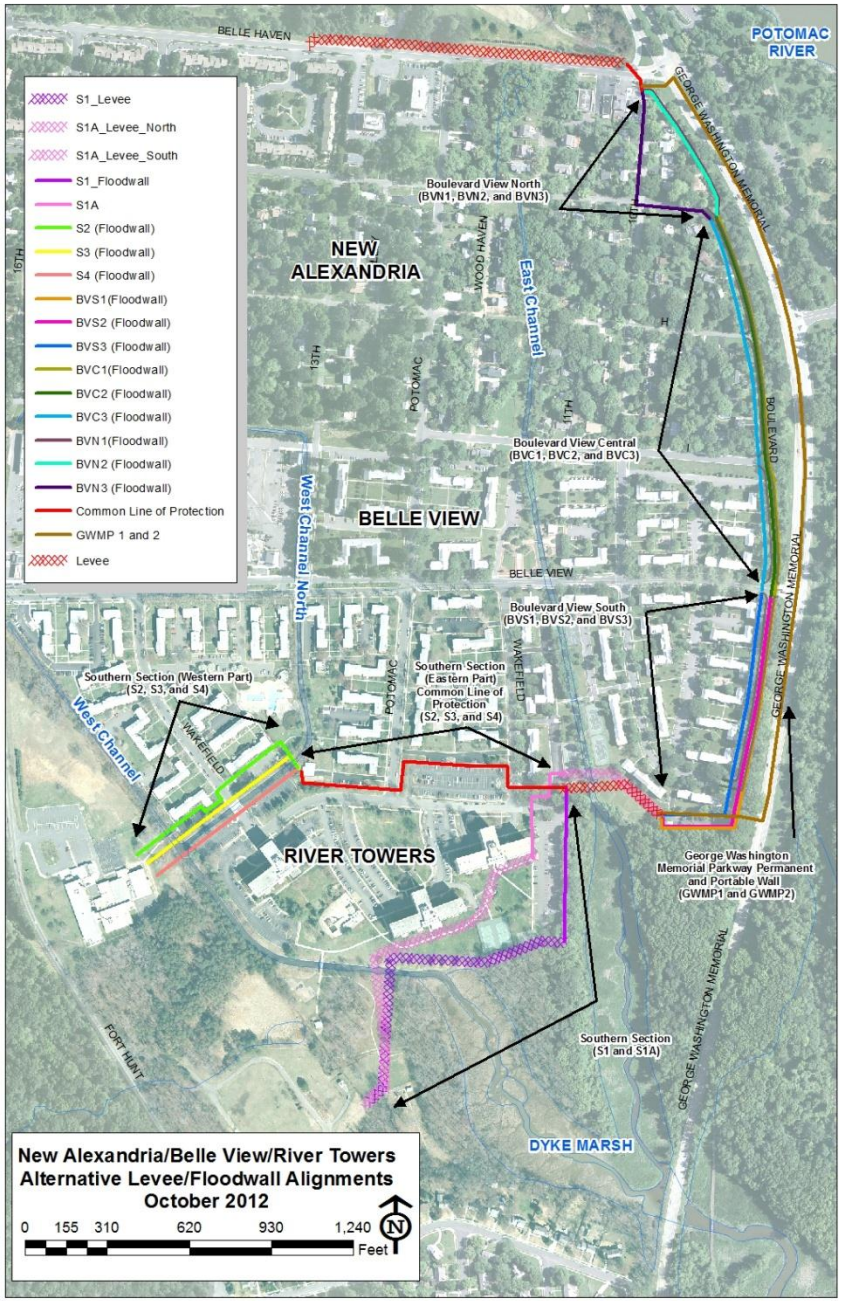
Height of Protection (Cont.)

- **Sea level rise predictions by the year 2100**
  - Based on historic rate = 1 foot
  - Based on Intergovernmental Panel on Climate Change (IPCC) study = between 0.6 - 1.9 feet
  - Based on National Research Council (NRC study) = between 1.5 – 4.7 feet
- **Height of floodwall/levee has not been decided; initially top of protection at elevation 12 feet has been used for concept plan so that is can be compared with original plan. However, 3 heights of protection will eventually be evaluated and compared for the final alignment; higher protection is recommended to account for risk and uncertainty and sea level rise**

Corps' Vegetation/Tree Setback Requirements

- Trees can adversely impact floodwalls and levees and cause the flood protection system to fail
- Vegetation/tree-free zone (except grass) extends 15 feet on each side of a floodwall
- If a large tree has the potential to damage the wall if it overturns, then it should be removed. General rule of thumb - trees should be a minimum distance of half their height from a floodwall
- County surveyed trees along potential alignments; arborist preliminarily identified highest priority trees based on species/condition
- Tree setback will be based on tree height and risk; we are currently showing a 40-foot setback

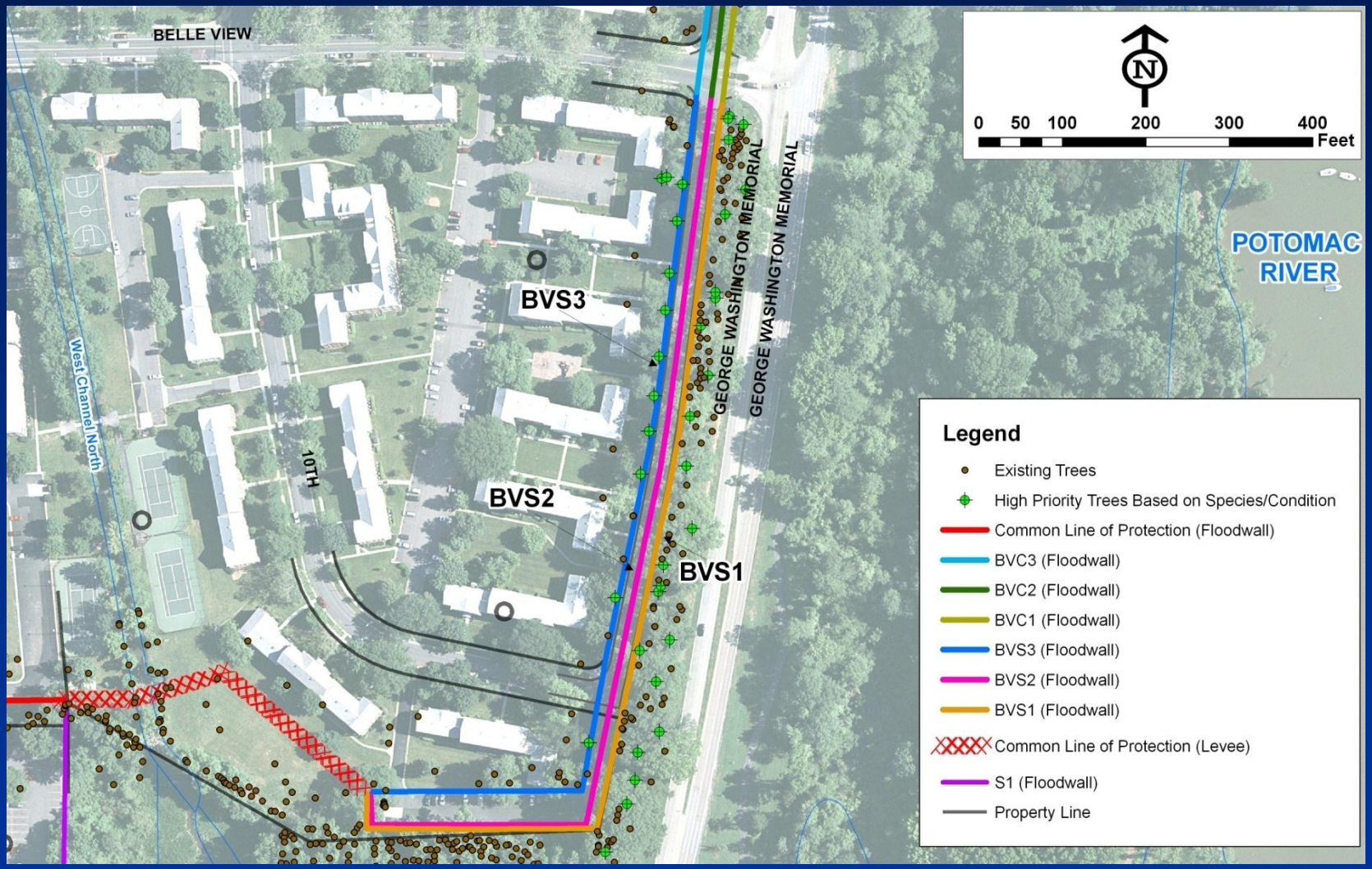
Alternative Floodwall/Levee Alignments



Boulevard View South
(South of Belle View Blvd)

- **Alternative BVS1 – Wall along eastern edge of Boulevard View (original alignment)**
- **Alternative BVS2 – Wall along center of Boulevard View**
- **Alternative BVS3 – Wall along western edge of Boulevard View**

Boulevard View South



Alternative BVS1

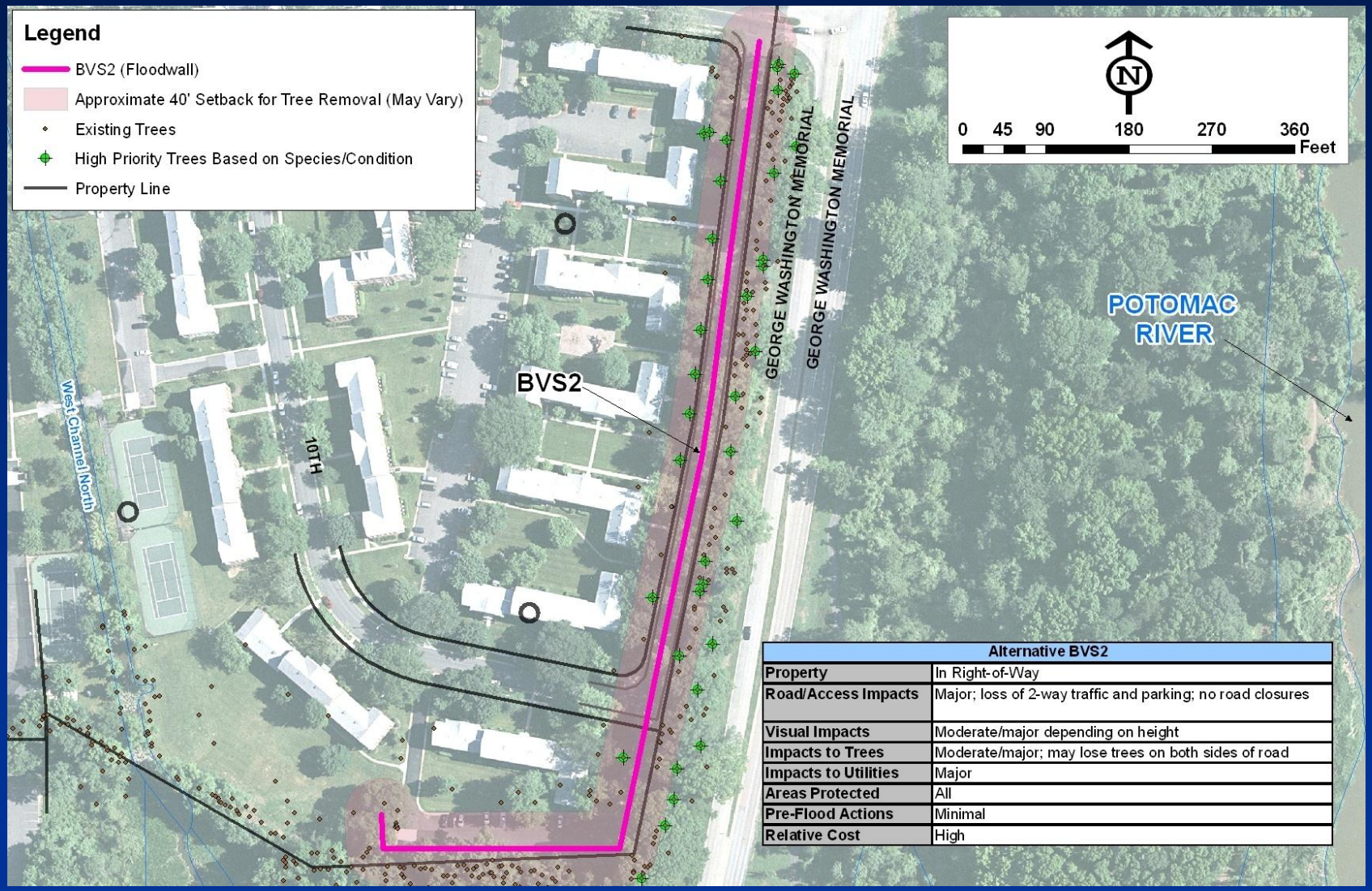
Alternative BVS1	
Property	In Right-of-Way; adjacent to NPS property (need temporary construction easement)
Road/Access Impacts	Minimal; no road closures
Visual Impacts	Moderate/major depending on height
Impacts to Trees	Major; loss of NPS trees
Impacts to Utilities	Least impact
Areas Protected	All
Pre-Flood Actions	Minimal
Relative Cost	Low

Boulevard View South
Looking South

Concept View of BVS1 Looking South
Floodwall Elevation 12 Feet

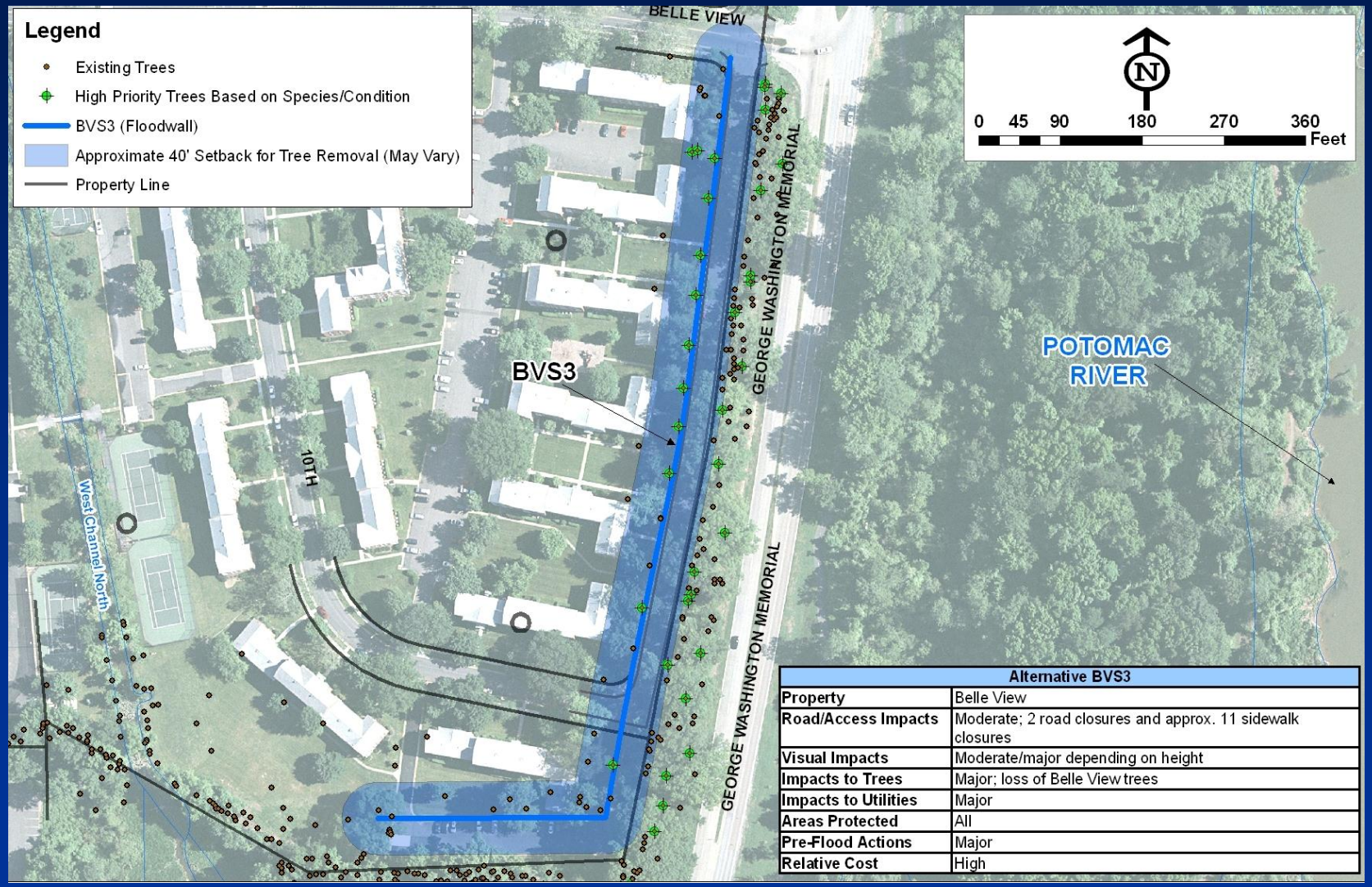
Concept View of BVS1Looking South
Floodwall Elevation 14.5 Feet

Alternative BVS2



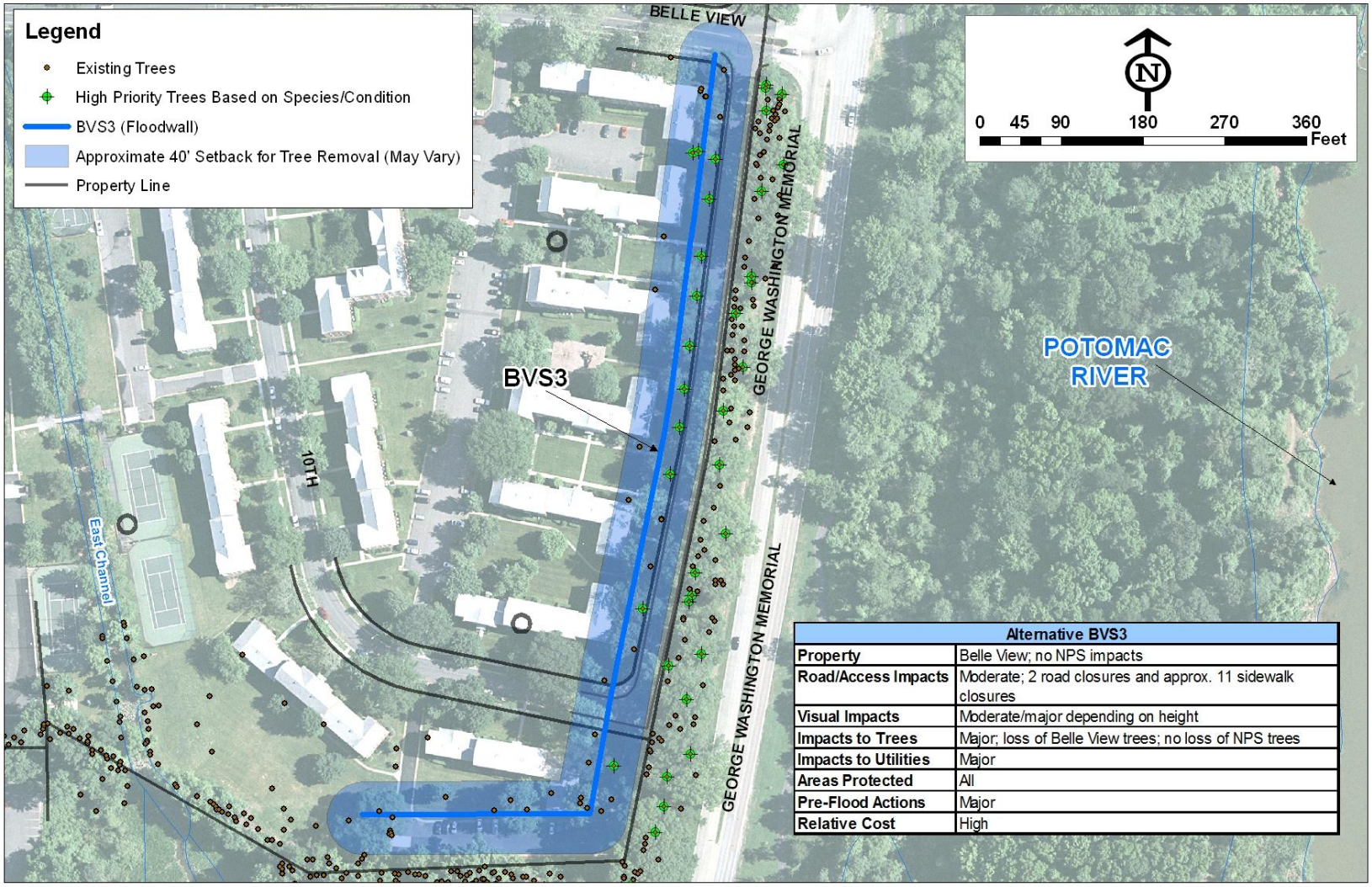
Alternative BVS2	
Property	In Right-of-Way
Road/Access Impacts	Major; loss of 2-way traffic and parking; no road closures
Visual Impacts	Moderate/major depending on height
Impacts to Trees	Moderate/major; may lose trees on both sides of road
Impacts to Utilities	Major
Areas Protected	All
Pre-Flood Actions	Minimal
Relative Cost	High

Alternative BVS3



Alternative BVS3	
Property	Belle View
Road/Access Impacts	Moderate; 2 road closures and approx. 11 sidewalk closures
Visual Impacts	Moderate/major depending on height
Impacts to Trees	Major; loss of Belle View trees
Impacts to Utilities	Major
Areas Protected	All
Pre-Flood Actions	Major
Relative Cost	High

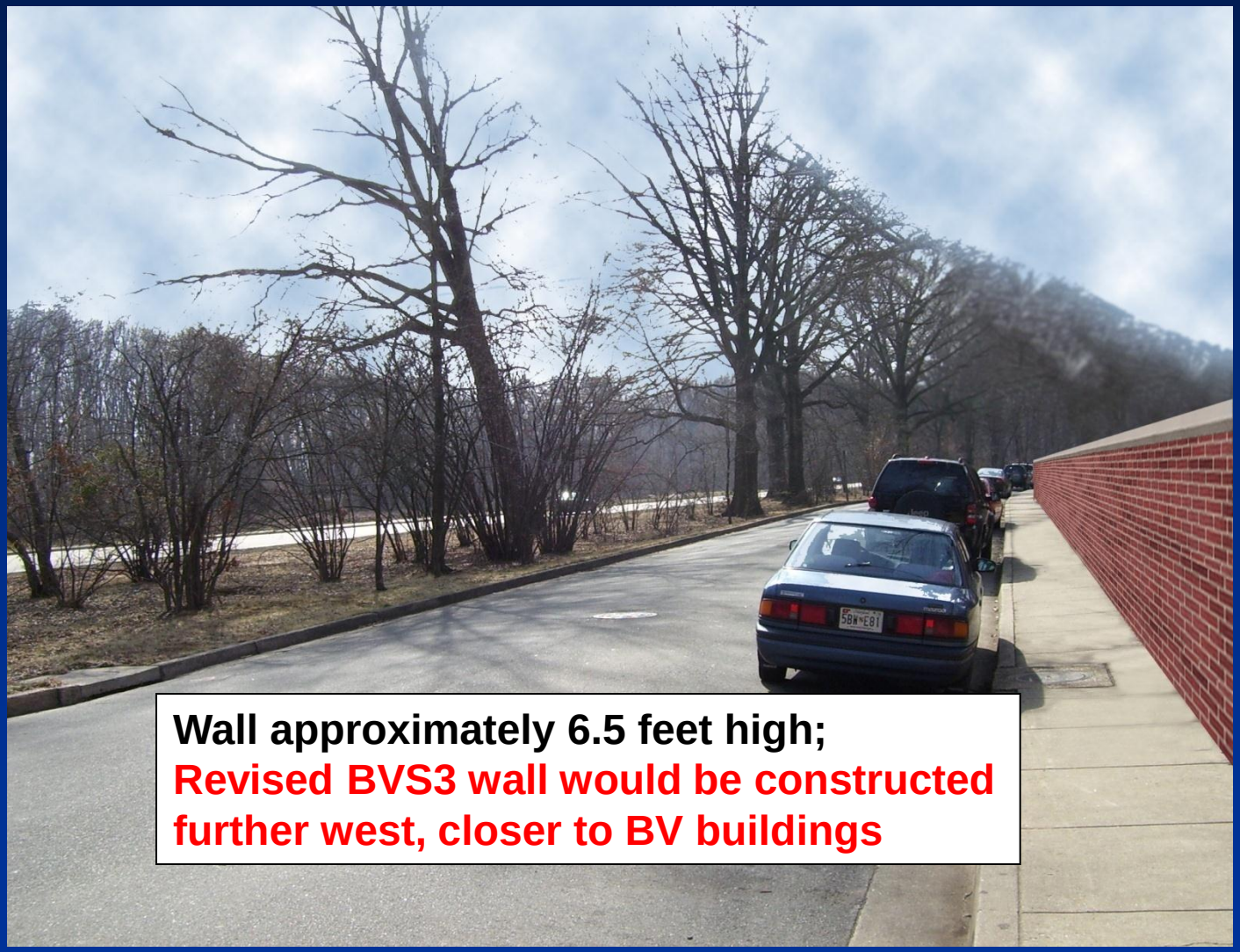
Revised Alternative BVS3



Alternative BVS3	
Property	Belle View; no NPS impacts
Road/Access Impacts	Moderate; 2 road closures and approx. 11 sidewalk closures
Visual Impacts	Moderate/major depending on height
Impacts to Trees	Major; loss of Belle View trees; no loss of NPS trees
Impacts to Utilities	Major
Areas Protected	All
Pre-Flood Actions	Major
Relative Cost	High

Concept View of BVS3 Looking South
Floodwall Elevation 12 Feet

Concept View of BVS3 Looking South
Floodwall Elevation 14.5 Feet

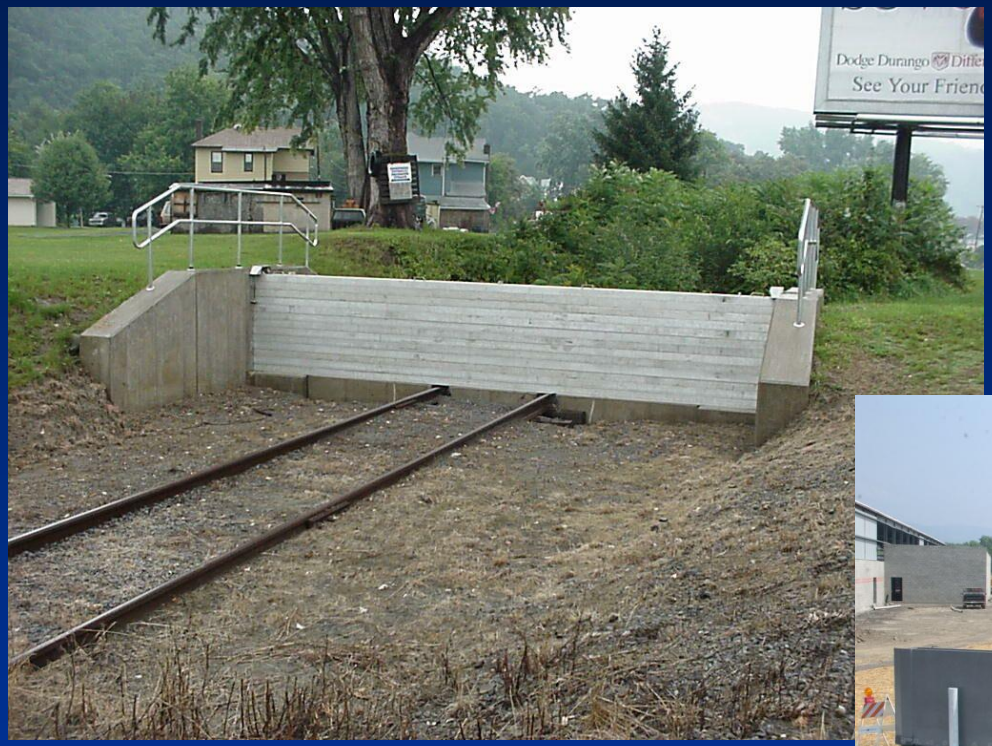


Boulevard View South
Looking West

Concept View of BVS3 Looking West
Floodwall Elevation 12 Feet

Concept View of BVS3 Looking West
Floodwall Elevation 14.5 Feet

Sample Closure Structures



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