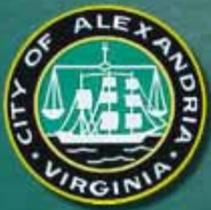


# WINDMILL HILL PARK BULKHEAD IMPROVEMENTS

## COMMUNITY MEETING

JUNE 20, 2007



Department of Transportation and Environmental Services  
Department of Recreation, Parks and Cultural Activities



# AGENDA

- ◆ Introduction
- ◆ Project Team
- ◆ Recent RK&K Projects
- ◆ Project Scope
- ◆ Key Project Features
- ◆ Next Steps
- ◆ Discussion



# PROJECT TEAM



# WHO IS RK&K?

- ◆ **84 Years of Professional Engineering Service**
- ◆ **No. 129 of ENR's Top 500 Design Firms**
- ◆ **13 Offices Serving the Mid-Atlantic Region**
- ◆ **630+ Employees – Nearly 500 in Baltimore, Virginia and District of Columbia**
- ◆ **Full Service Firm**
- ◆ **Extensive Experience, Expertise and Diversity**



# SUBCONSULTANT

## ◆ Underwood & Associates

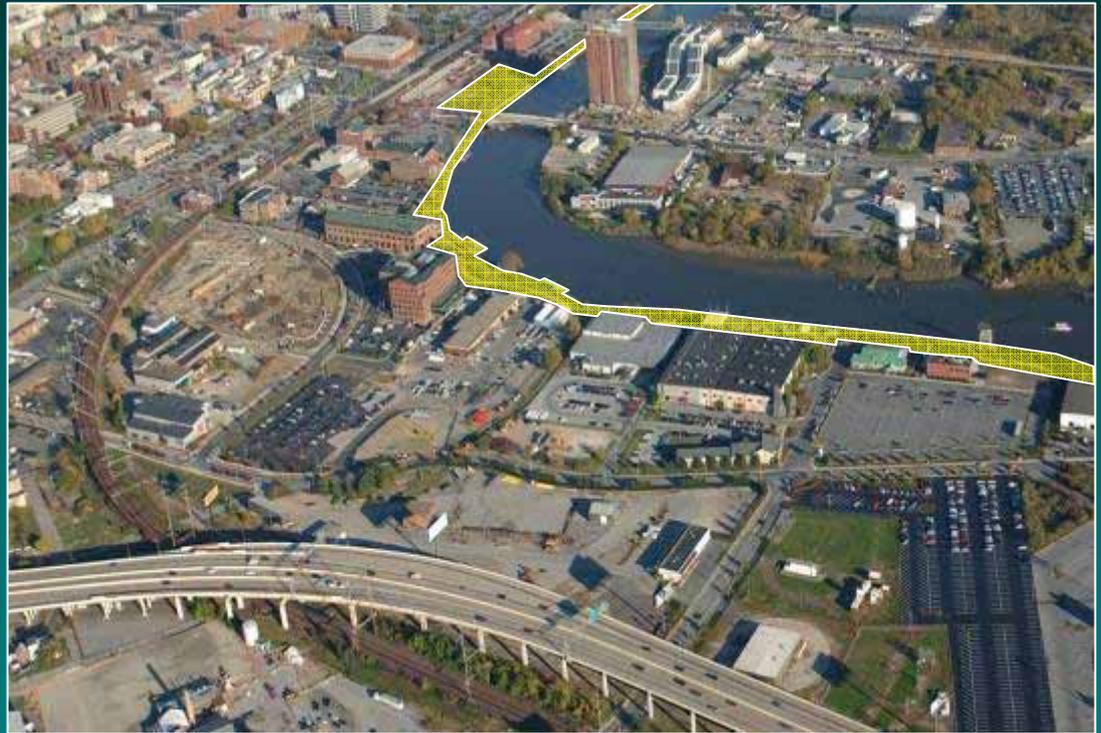
- Established for 15 Years in Annapolis, MD
- Expertise in the Restoration and Creation of Natural Shorelines
- Provide Design and Construction Services



# WILMINGTON RIVERFRONT

Wilmington, DE, City of Wilmington, DeIDOT and Riverfront Development Corporation

- ◆ **Joint Initiative to Redevelop the Riverfront as a Mixed Use Residential, Office and Commercial Complex**
- ◆ **Civil / Structural Engineer for all Public Infrastructure, and 1.2 mile Riverfront Walkway**
- ◆ **Bulkheads, Piers and Floating Docks**
- ◆ **Bridge Rehabilitation / Aesthetics**
- ◆ **Shoreline Restoration / Stabilization / Wetland Creation**
- ◆ **Pedestrian Facilities**
- ◆ **Park and Recreational Facilities**
- ◆ **Landscape Design**



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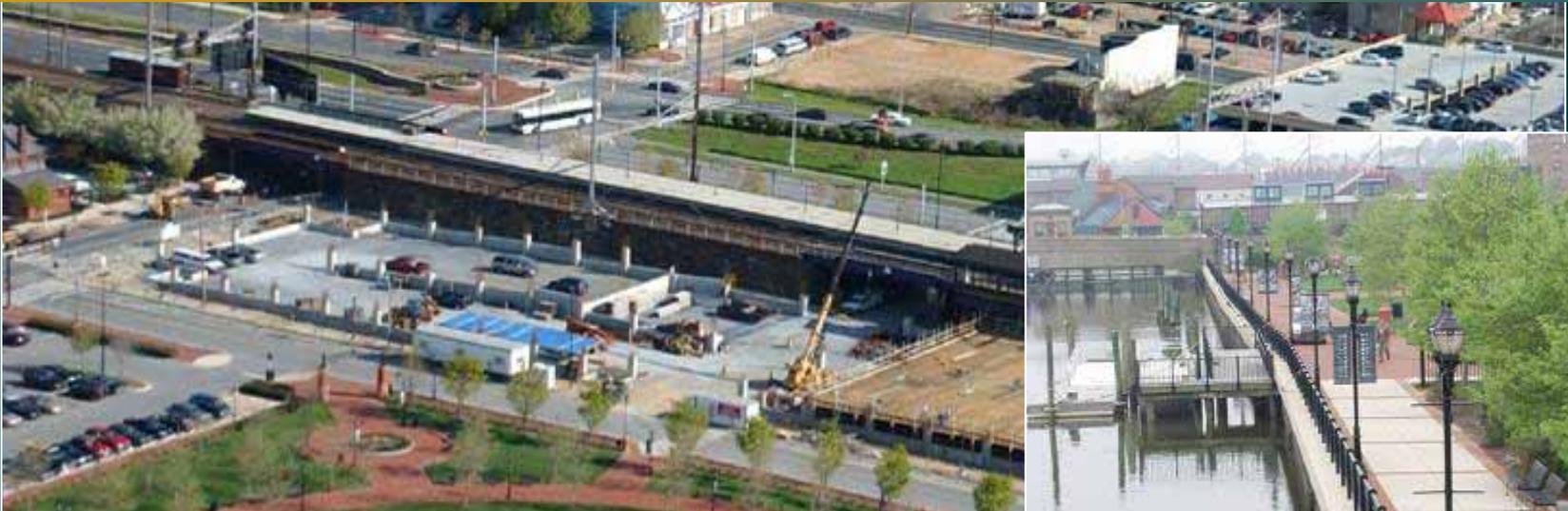


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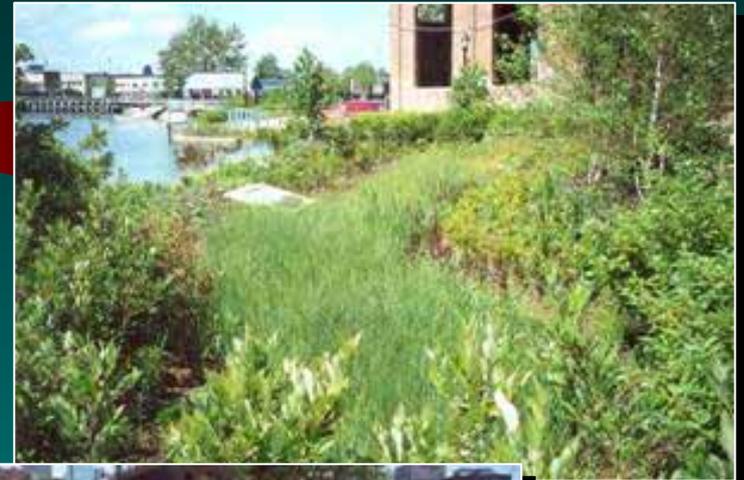


# WILMINGTON RIVERFRONT

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## SHORELINE STABILIZATION

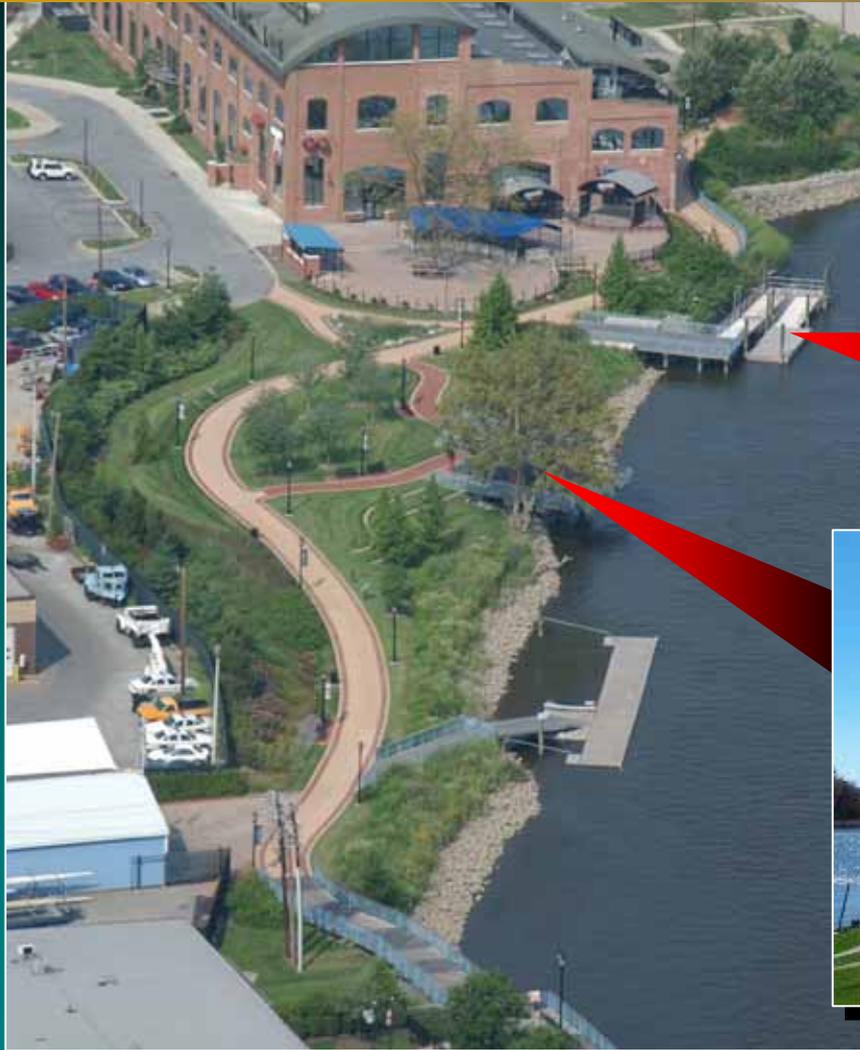


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## PIER AND FLOATING DOCK



## OVERLOOK PAVILION



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# NORTH & SOUTH LAKE HOLLY DRAINAGE STUDY - VA BEACH

- ◆ 400-Acre Watershed Analysis and Flood Control Study
- ◆ Tidal Influenced Impoundment Behind Virginia Beach
- ◆ Phased Water Quality, Flood Control & Drainage Improvements
- ◆ Structure Modifications, Grading
- ◆ Water Quality Forebay Creation
- ◆ Wetland Creation
- ◆ Shoreline Stabilization



# FREDERICK DOUGLAS-ISAAC MYERS MARITIME PARK - BALTIMORE MD

- ◆ Key Link in 6-mile Pedestrian Walkway Around Baltimore's Inner Harbor
- ◆ Fells Point Historic District
- ◆ 430-Feet of Bulkhead and Timber Promenade
- ◆ Steel Sheet-Pile Cutoff Walls and Concrete Relieving Platform
- ◆ 200-Foot Timber Pier



BEFORE



# FREDERICK DOUGLAS-ISAAC MYERS MARITIME PARK - BALTIMORE MD

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AFTER



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AFTER

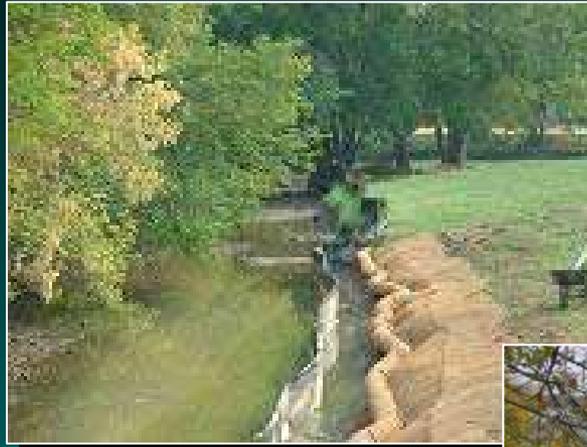


# WOODROW WILSON BRIDGE ENVIRONMENTAL - MD/VA/DC

- ◆ Environmental Assessment and Design
- ◆ Wetland Creation
- ◆ Shoreline Restoration
- ◆ Regulatory Agency Coordination
- ◆ Environmental Permitting
- ◆ Construction Inspection

## MASON NECK

- 1,200-foot Shoreline Restoration
- 8 Breakwaters
- 400-Foot Shoreline Revetment
- 5-Acres Shallow Fish Habitat Creation



## FOUR MILE RUN PARK

- 0.5-Mile Tidal Wetland Creation
- Riparian Enhancement
- Stream Restoration



## BELLE HAVEN, HUNTING CREEK AND CAMERON RUN

- 4.1-Acres of Tidal Wetland Creation
- 0.8-Acres of Riparian Enhancement





# WINDMILL HILL PARK BULKHEAD - PROJECT FEATURES

- ◆ Utilize a Combination of Structural Bulkhead, Hard Edge Treatments and Natural Shoreline Vegetation at Park's Interface with the Water
- ◆ Accommodate a Variety of Activities
  - Walking / Strolling
  - Relaxing / Reading
  - Nature Watching
  - Aquatic Habitat Creation
  - Kayaking
  - Dog Play



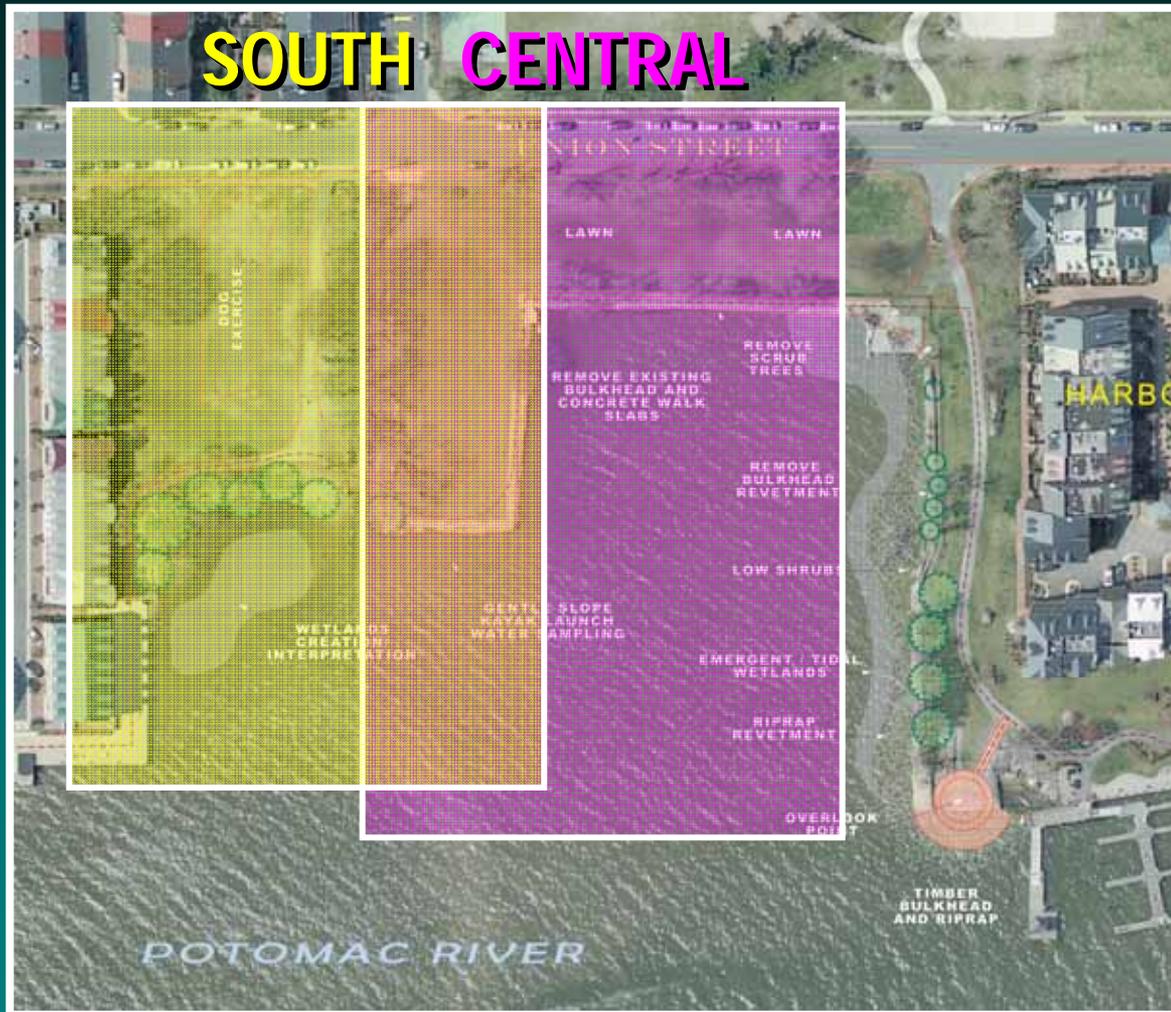
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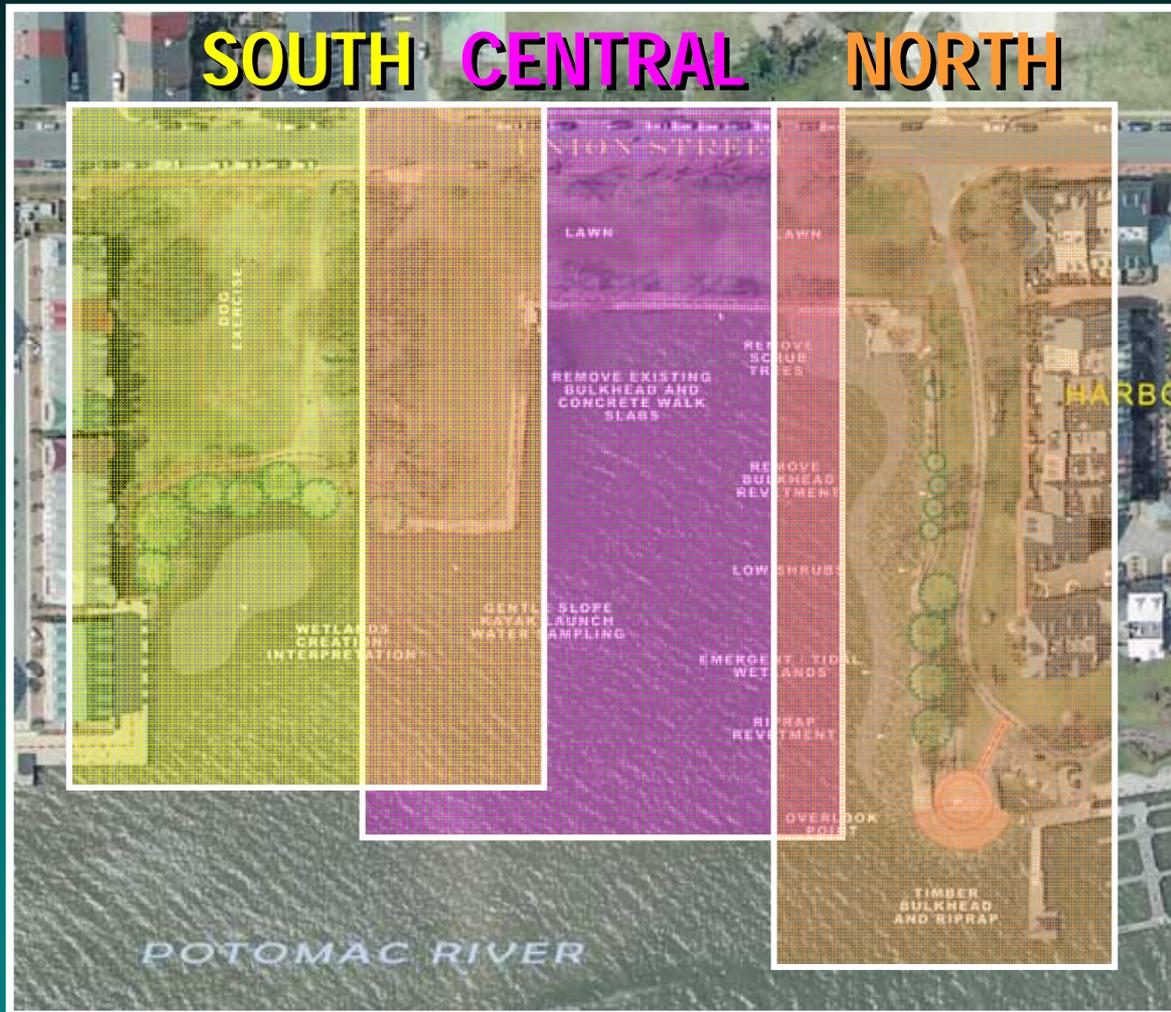
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# WINDMILL HILL PARK BULKHEAD - PROJECT FEATURES

## SOUTH SHORELINE

### ◆ Key Features

- Restore Natural Shoreline
- Create Wetland Marsh
- Accommodate Dog Access to Water
- Address Accumulation of Debris



# WINDMILL HILL PARK BULKHEAD - PROJECT FEATURES

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*Replace existing vegetation and debris...*



# WINDMILL HILL PARK BULKHEAD - PROJECT FEATURES

## SOUTH SHORELINE

### ◆ Key Features

- Restore Natural Shoreline
- Create Wetland Marsh
- Accommodate Dog Access to Water
- Address Accumulation of Debris



*Replace existing vegetation and debris...  
...with a “Natural Shoreline”*



# WINDMILL HILL PARK BULKHEAD - PROJECT FEATURES

## CENTRAL SHORELINE

### ◆ Key Features

- Kayak Launch
- Bulkhead

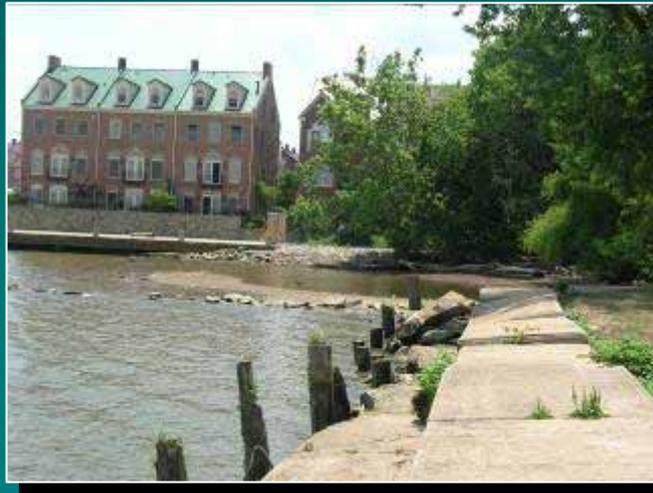


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## CENTRAL SHORELINE

### ◆ Key Features

- Kayak Launch
- Bulkhead



# WINDMILL HILL PARK BULKHEAD - PROJECT FEATURES

## CENTRAL SHORELINE

### KAYAK OPTIONS

#### GRADED SHORELINE:

- Easy “Soft” Access
- Accommodates Tidal Fluctuations
- Low Cost
- Low Maintenance



# WINDMILL HILL PARK BULKHEAD - PROJECT FEATURES

## CENTRAL SHORELINE

### KAYAK OPTIONS

#### FLOATING DOCK:

- Easy Access to Water Surface
- Accommodates Tidal Fluctuations
- Requires 2-3 ft. Water Depth to Float
- Higher Cost
- Higher Maintenance



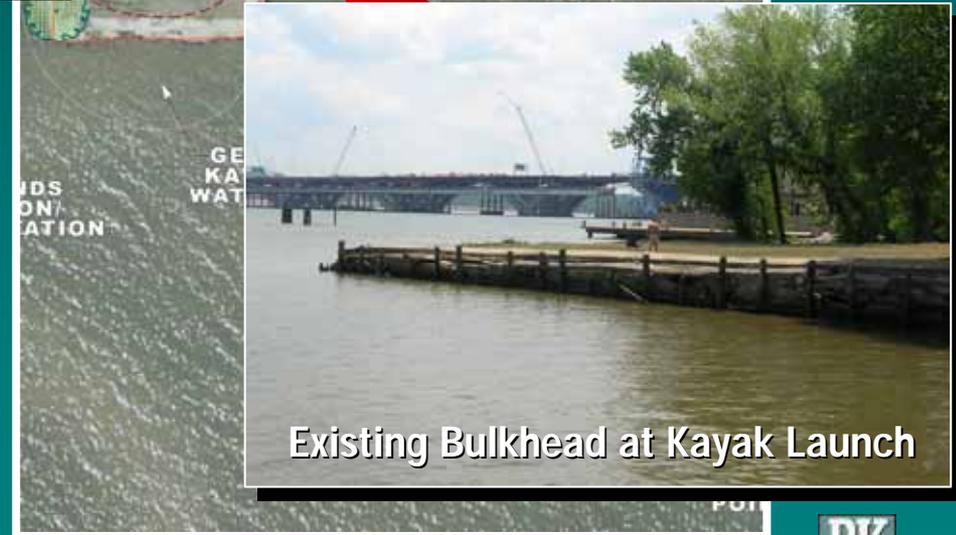
# WINDMILL HILL PARK BULKHEAD - PROJECT FEATURES

## CENTRAL SHORELINE

### KAYAK OPTIONS

#### STEP-DOWN PLATFORMS:

- Firm Surface Provides Easy Access
- Accommodates Tidal Fluctuations
- Non-Accessible to Persons With Disabilities
- Higher Cost / Higher Maintenance



# WINDMILL HILL PARK BULKHEAD - PROJECT FEATURES

## CENTRAL SHORELINE

### ◆ Key Features

- Kayak Launch
- Bulkhead

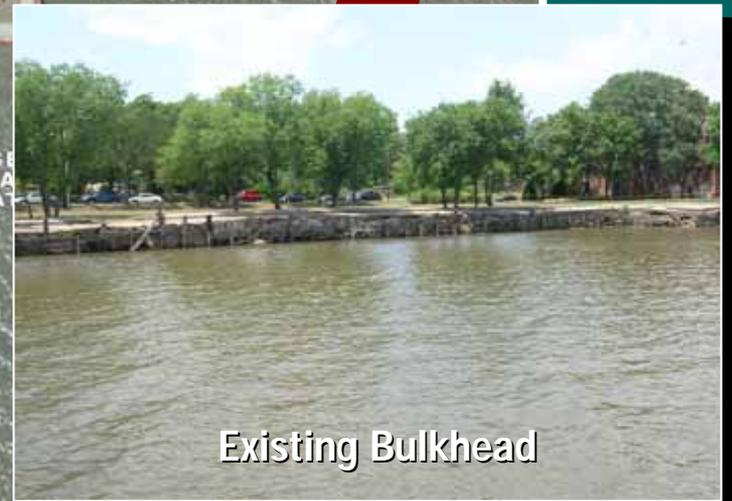


# WINDMILL HILL PARK BULKHEAD - PROJECT FEATURES

## CENTRAL SHORELINE

### TIMBER BULKHEAD

- Aesthetic Characteristics of Wood
- Less Durable
- Lower Initial Cost

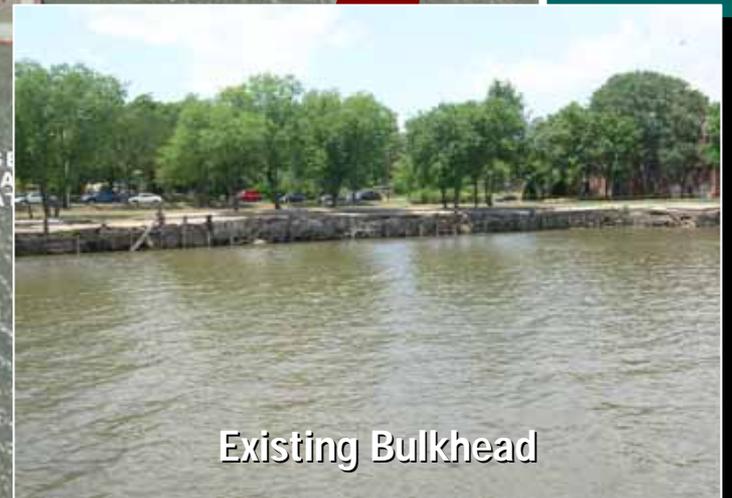


# WINDMILL HILL PARK BULKHEAD - PROJECT FEATURES

## CENTRAL SHORELINE

### STEEL SHEET PILE BULKHEAD

- Durable
- Cost Effective
- Lower Maintenance
- Higher Construction Cost



# WINDMILL HILL PARK BULKHEAD - PROJECT FEATURES

## CENTRAL SHORELINE

### RELIEVING PLATFORM

- Accessibility to Deeper Water
- More Difficult Access to Debris
- Higher Construction Cost

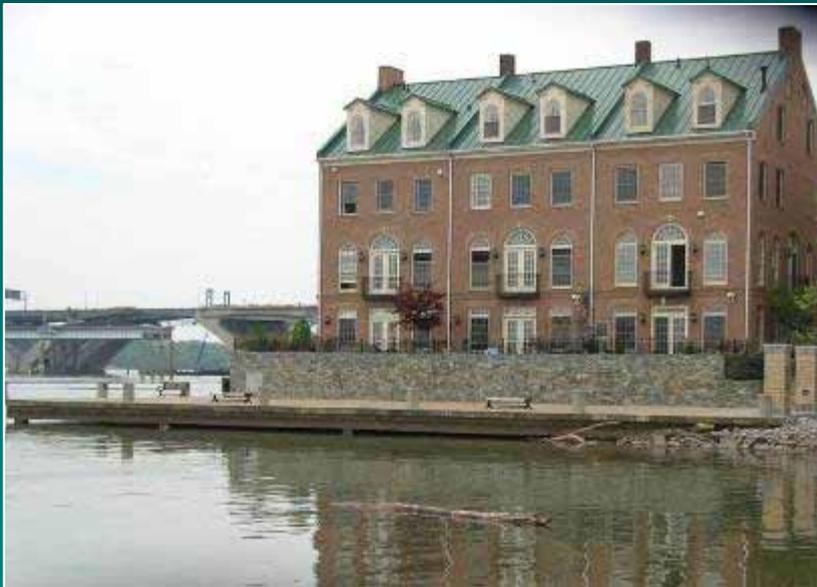


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## CENTRAL SHORELINE

### RELIEVING PLATFORM

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- Higher Construction Cost



# WINDMILL HILL PARK BULKHEAD - PROJECT FEATURES

## NORTH SHORELINE

### ◆ Key Features

- Natural Shoreline
- Riprap Revetment
- Overlook Point
- Bulkhead



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- Overlook Point
- Bulkhead

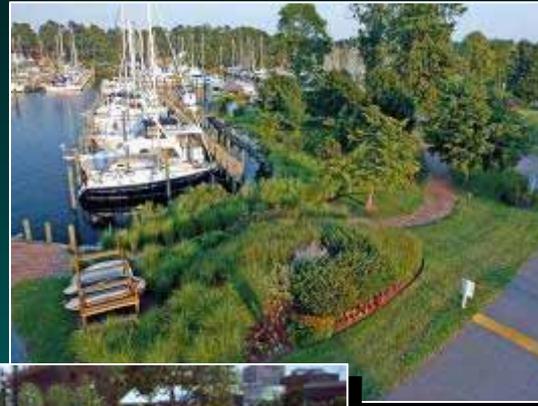


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## NORTH SHORELINE

### ◆ Key Features

- Natural Shoreline
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- Overlook Point
- Bulkhead



# NEXT STEPS

- ◆ Assess Project Needs . . . . . Now!
- ◆ Obtain and Incorporate Community Feedback . . . . . Now!
- ◆ Complete Topographic Surveys and Data Collection . . . . . Summer '07
- ◆ Present Preliminary Design to Community . . . . . Fall / Winter '07
- ◆ Complete Design . . . . . Fall '08
- ◆ Begin Construction . . . . . Spring '09



# QUESTIONS AND ANSWERS



Department of Transportation and Environmental Services  
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