



Henry Hudson Park Shoreline Stabilization Study

June 2011

Prepared For:
The Town of Bethlehem



Company Introduction - OCC



Ocean and Coastal Consultants (OCC) is a 50 person engineering consulting firm that specializes in providing marine-related professional services. OCC was founded in 1983 and has offices in Connecticut, New Jersey, Massachusetts and South Carolina. They have extensive Hudson River project experience and has performed similar studies along public waterfront parks throughout the East Coast.

Some of the types of services OCC provides include:

- Marina / Waterfront Planning & Design
- Structural & Geotechnical Engineering
- Regulatory Services
- Coastal Engineering & Coastal Resource Evaluations
- Dredging / Civil Engineering
- Underwater Dive Inspections
- Construction Administration / Resident Engineering
- IT / GIS Database Development



Presentation - Outline



History

Shoreline
Segments

Path Forward

Shoreline Analysis
Approach &
Results

Recommendations



Henry Hudson Park History



1860s

Army Corps of Engineers built w/ Dredged Spoils & Timber Cribbing

1900s

Shoreline Capped w/Concrete

2006

Hudson River Shoreline Restoration Alternative Analysis

2006

Town completed its Local Waterfront Revitalization Program (LWRP)

2007

Completed Master Plan

Awarded NYSDEC Hudson Program Grant

2010

Town applied for a USACE Permit for the Floating Fishing Platform

2011

OCC Performed Study

Fishing Platform to be constructed this Summer



Shoreline Analysis Approach

Shoreline Analysis Approach

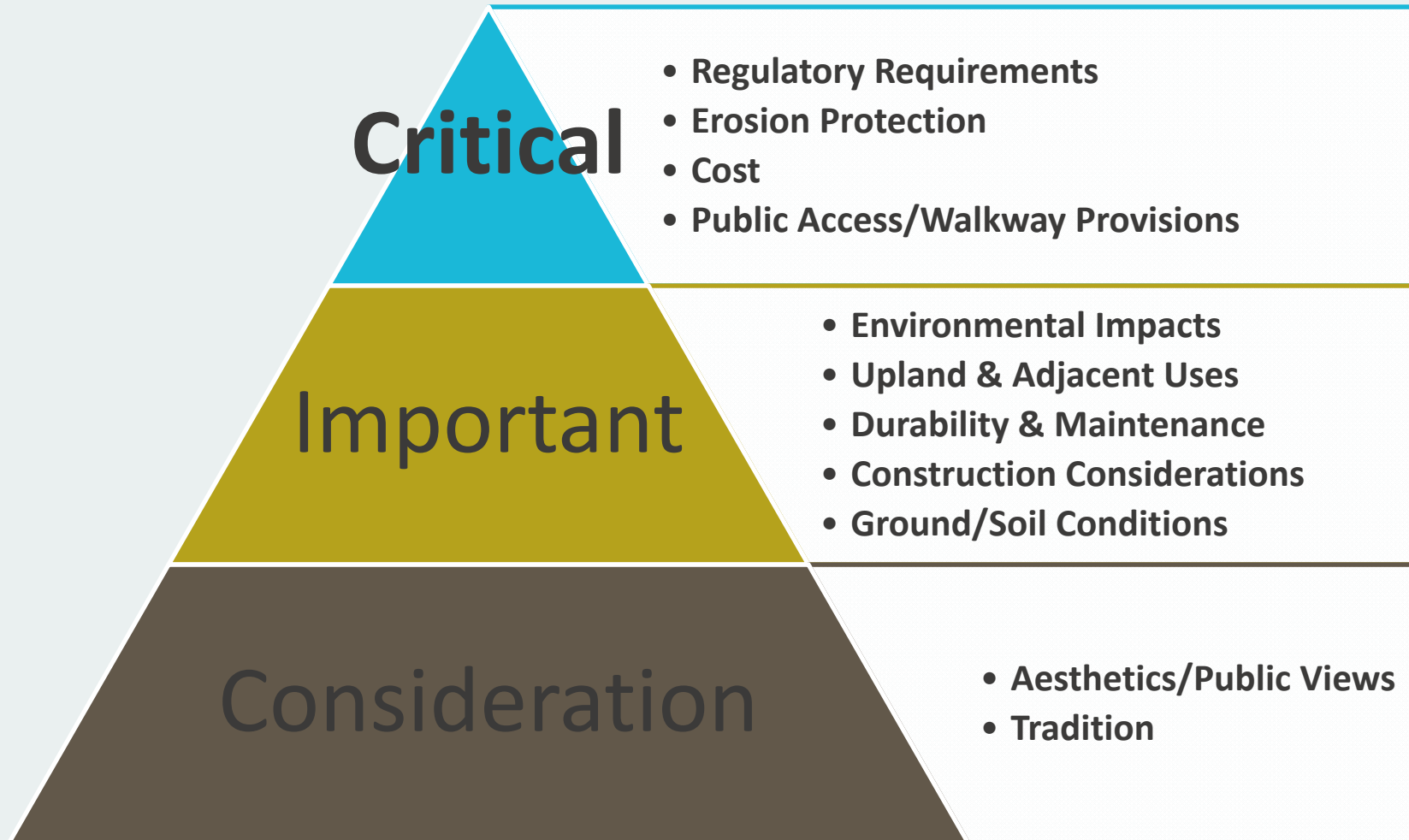
Site Constraints & Project Requirements



Ground/Soil Conditions	• Soil Type (water, land)
Regulatory Requirements	• Permitting, Boundaries, Materials
Erosion Protection	• Effectiveness against site conditions, wake
Aesthetics/Public Views	• Appearance
Environmental Impacts	• Wildlife, Water Quality
Public Access/Walkway Provisions	• Access to Water, Future
Upland & Adjacent Uses	• Surcharge Loads, Space
Construction Considerations	• Material Availability, Installation
Cost	• Materials, Labor, Installation
Durability & Maintenance	• Longevity, Upkeep
Tradition	• Typical Methods Used in Area

Shoreline Analysis Approach

Assigned Importance Rating



Shoreline Analysis

Shoreline Alternatives Evaluated



**Rock Riprap
Revetment**



**Timber
Bulkhead**



**Vegetated
Geogrid**



Live Crib Wall



Joint Planting

Shoreline Analysis Approach

Rated Selection Factor to Alternatives



- Score of 1 to 4 → 4 most suitable
- Suitability for each Project Requirement

Question / Example: **Which shoreline alternative is the most economical?**



Rock Riprap Revetment

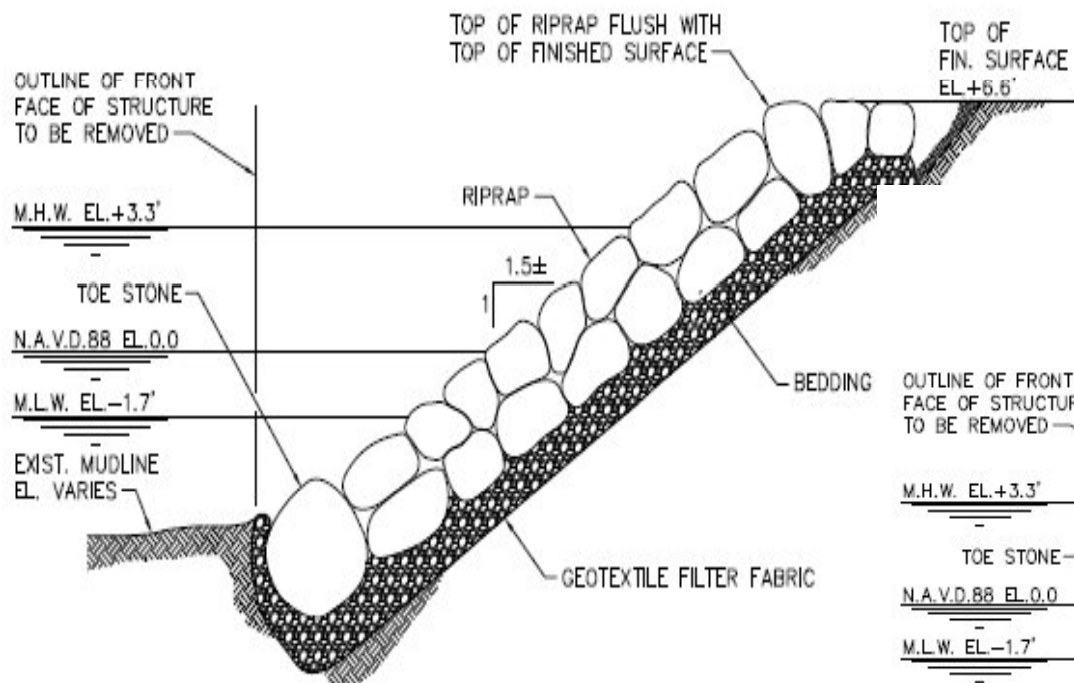
4

Shoreline Analysis Approach

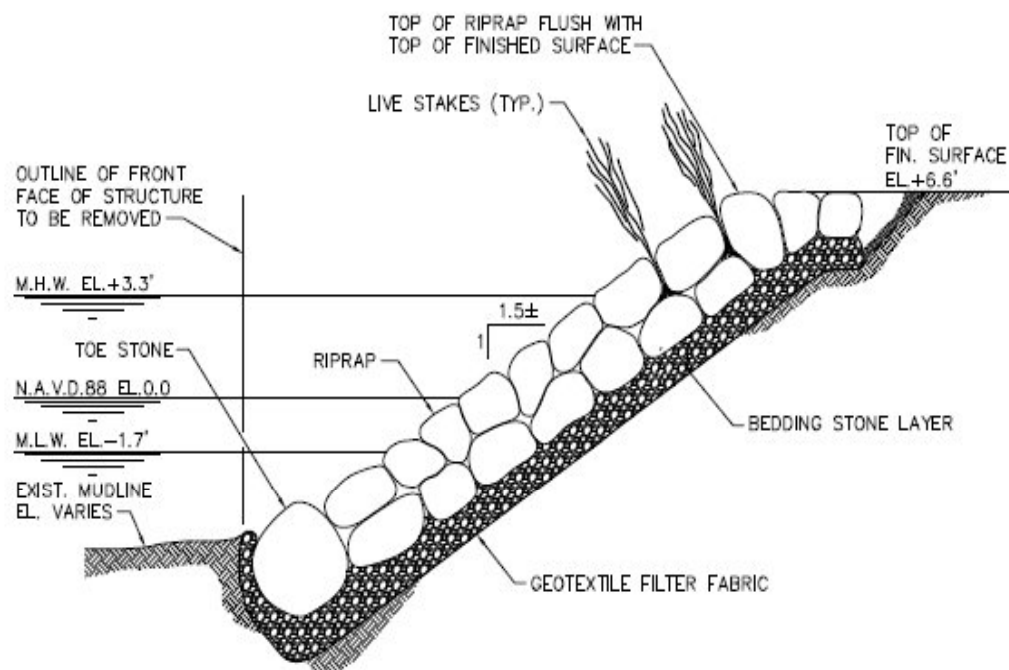
Shoreline Alternative Results



#1 - Rock Riprap Revetment



#2 - Joint Planting



Shoreline Analysis Approach

Joint Planting





Shoreline Segments

1
2

Henry Hudson Park Shoreline Stabilization Study
June 2011



Shoreline Inventory – Segment A



Segment A
"Overlook Area"

Existing Conditions

Segment A – "Overlook Area"



Northern Portion (A1)



Existing Conditions

Segment A – "Overlook Area"



Southern Portion (A2)

Recommended Use

Segment A – "Overlook Area"

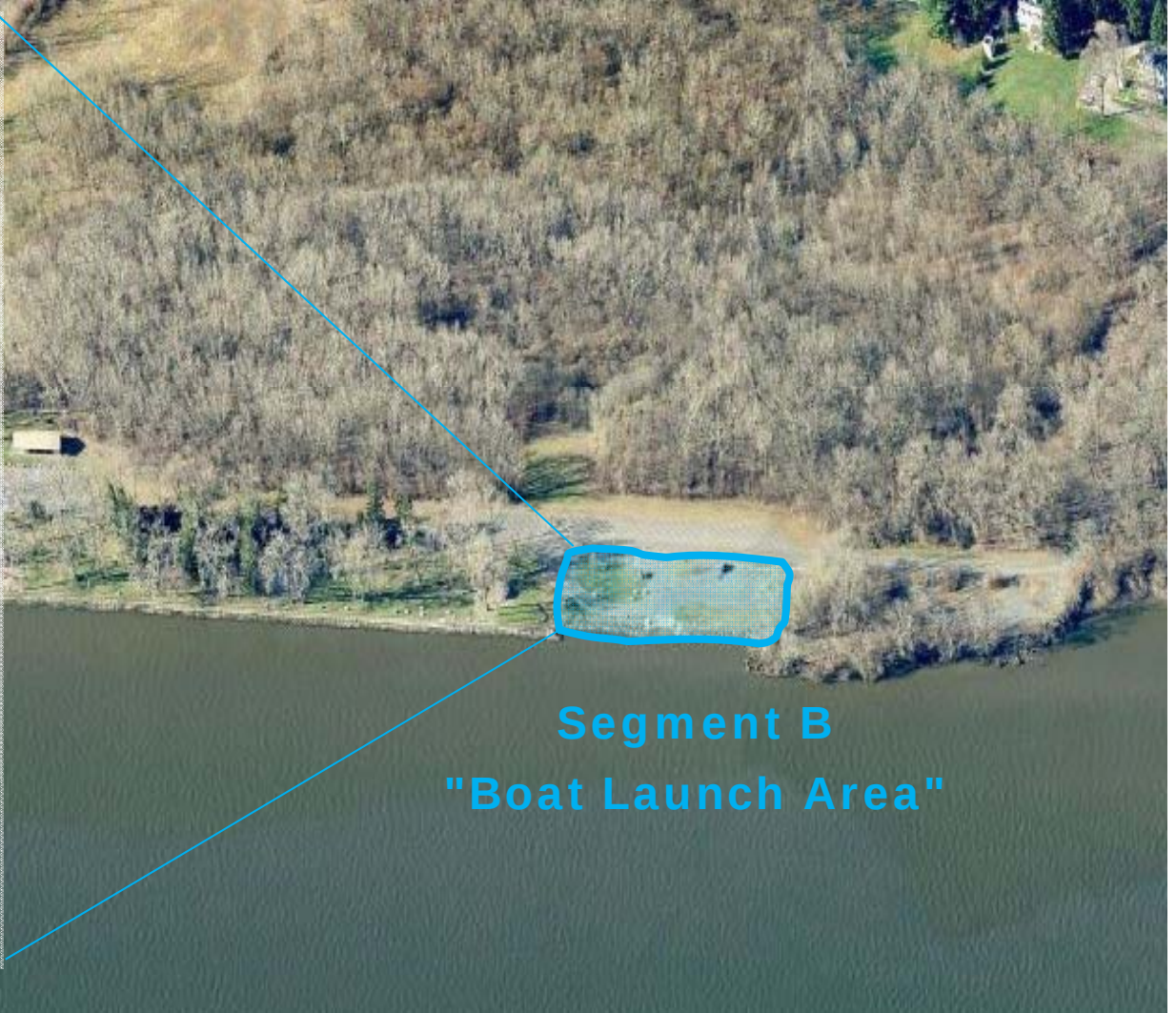


Future Kayak Launch

- Existing Use
- Sheltered
- Location

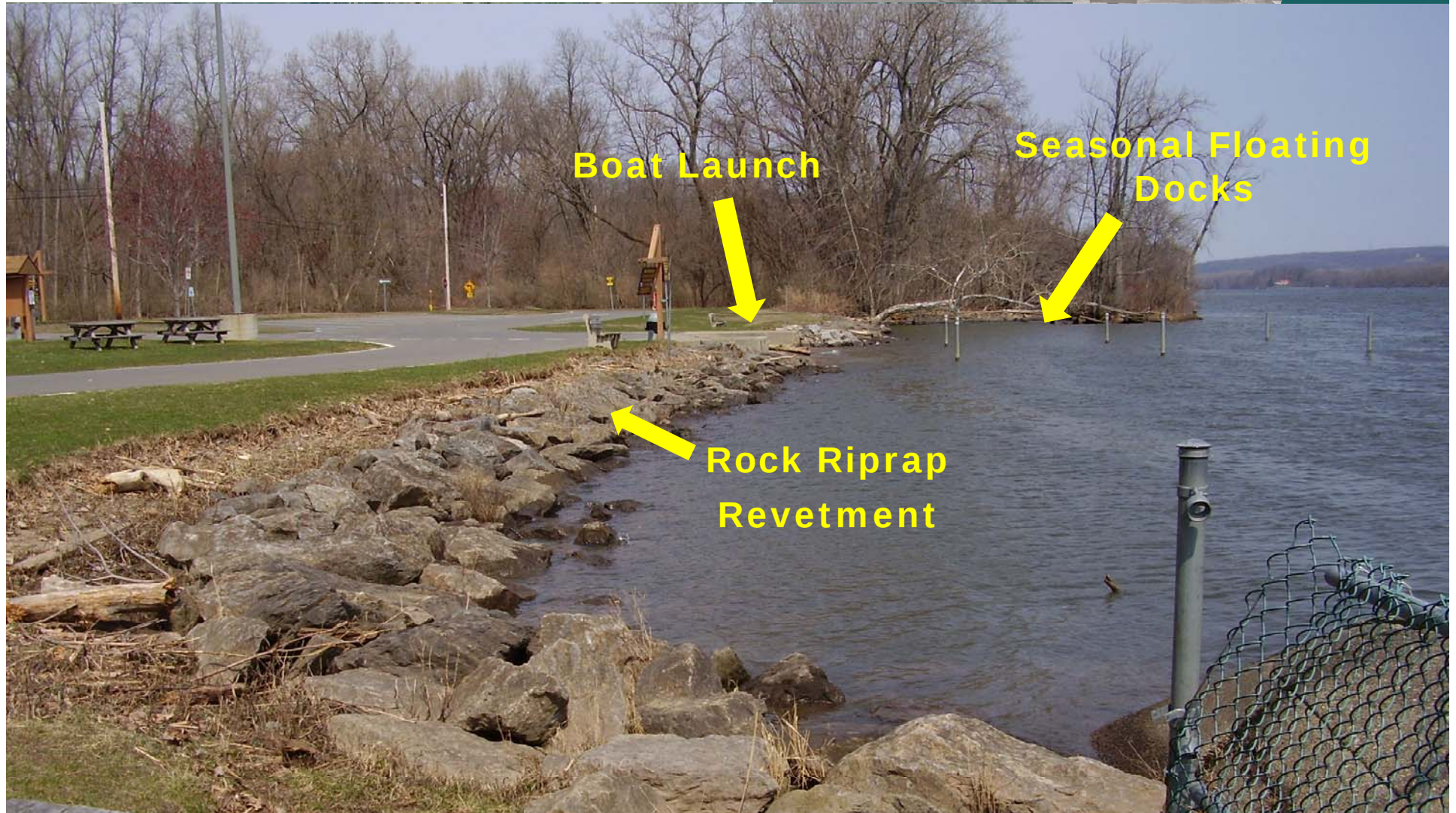


Shoreline Inventory – Segment B



Existing Conditions

Segment B – "Boat Launch Area"



Shoreline Inventory – Segment C



Segment C
"Fishing Platform
Area"

Existing Conditions

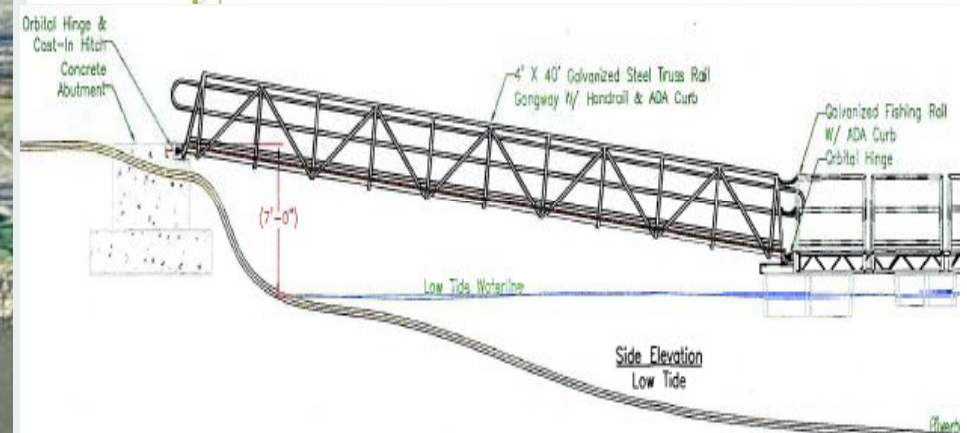
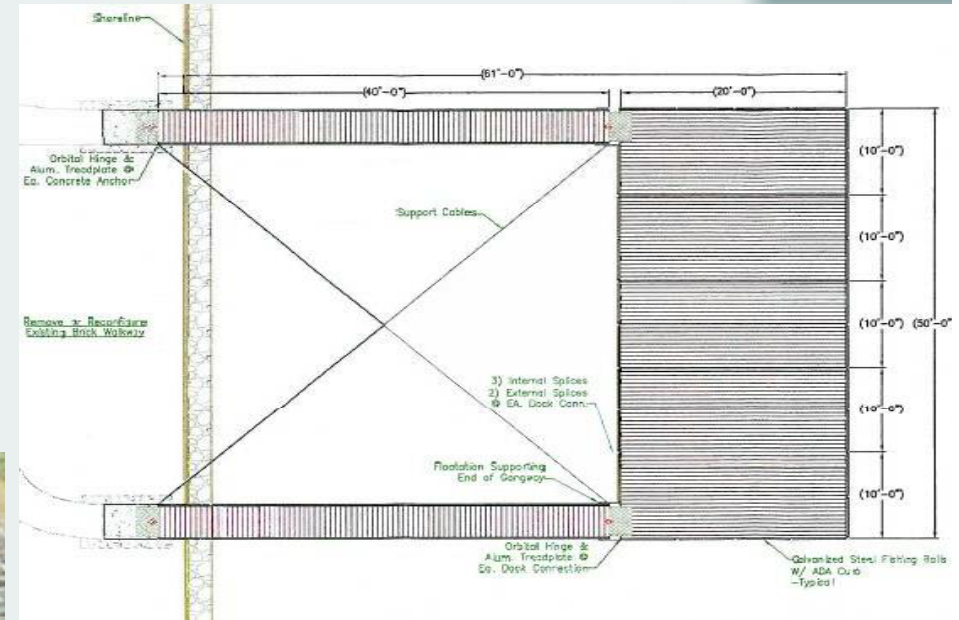
Segment C – "Fishing Platform Area"



Future Use

Segment C – "Fishing Platform Area"

To be Installed Summer 2011



Shoreline Inventory – Segment D



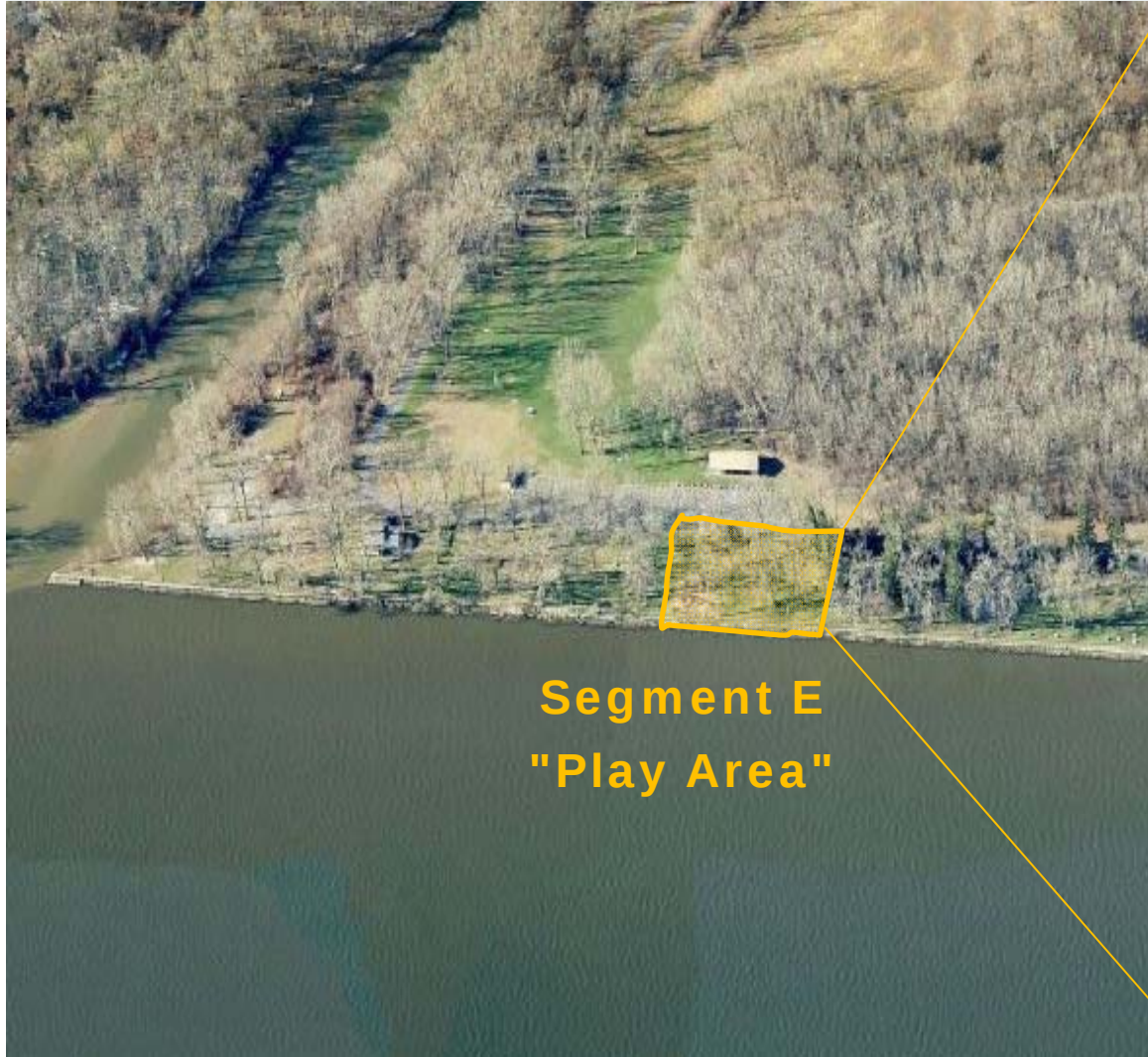
Segment D
"Picnic Area(s)"

Existing Conditions

Segment D – "Picnic Area(s)"

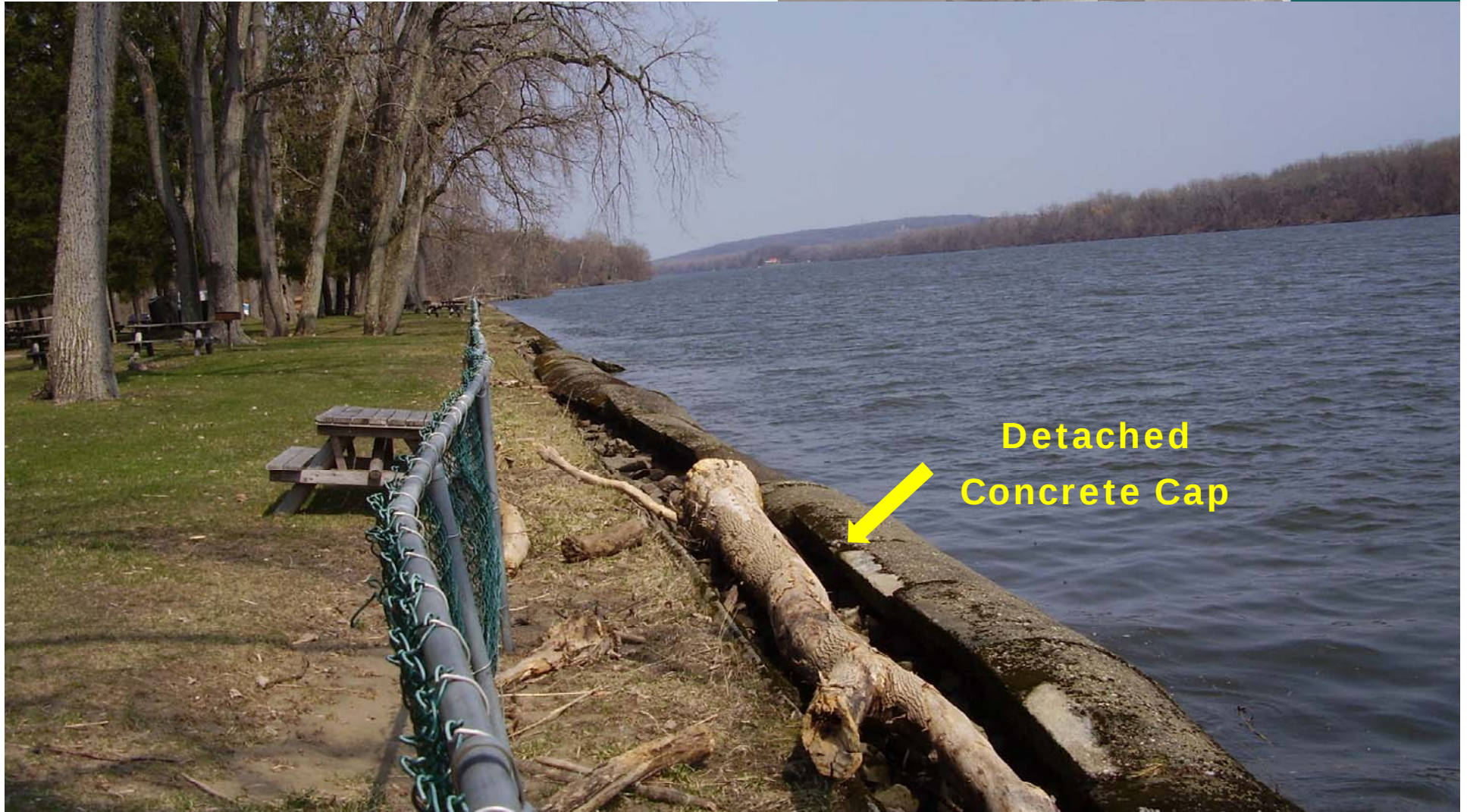


Shoreline Inventory – Segment E



Existing Conditions

Segment E – "Play Area"



Detached
Concrete Cap

Shoreline Inventory – Segment F

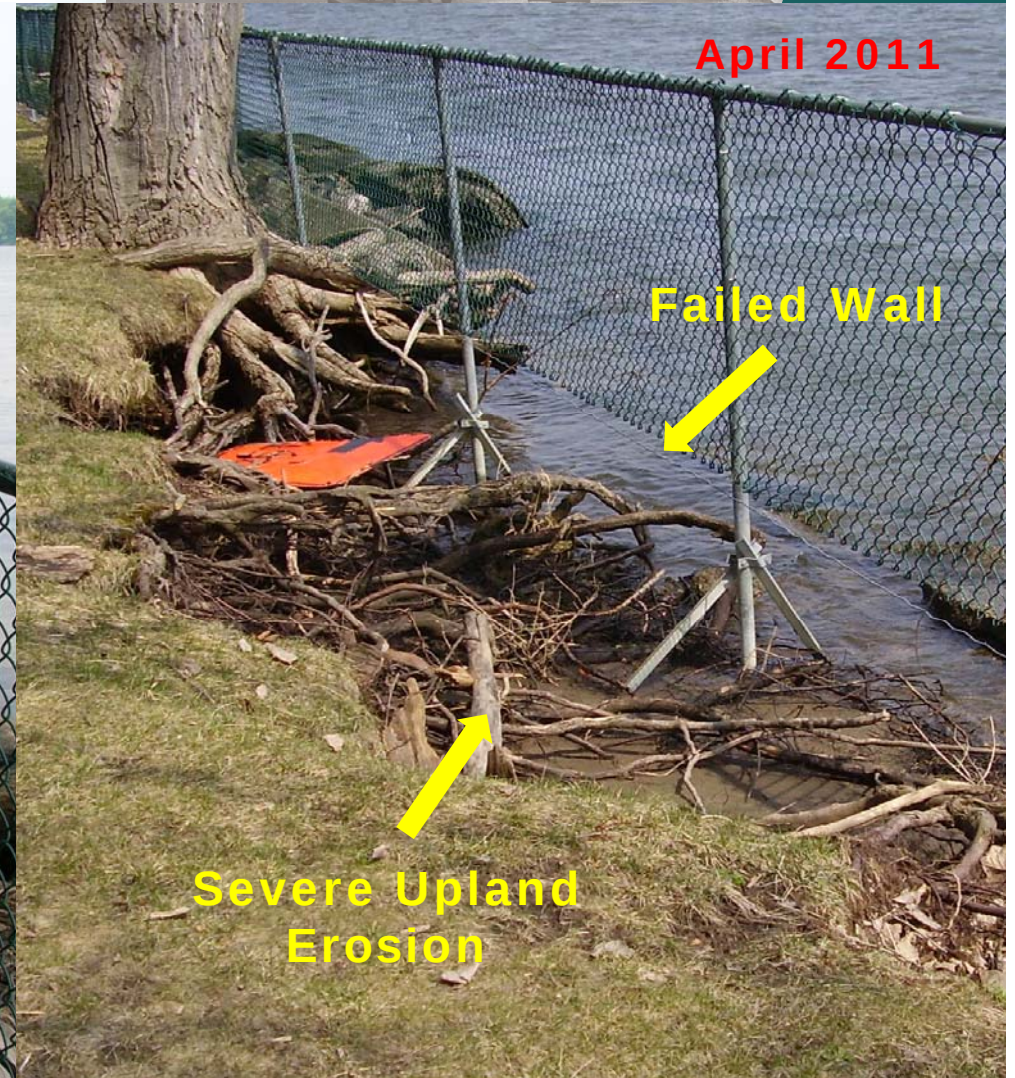


Segment F
"Large Group Picnic
Area 1"



Existing Conditions

Segment F – "Large Group Picnic Area 1"



Shoreline Inventory – Segment G

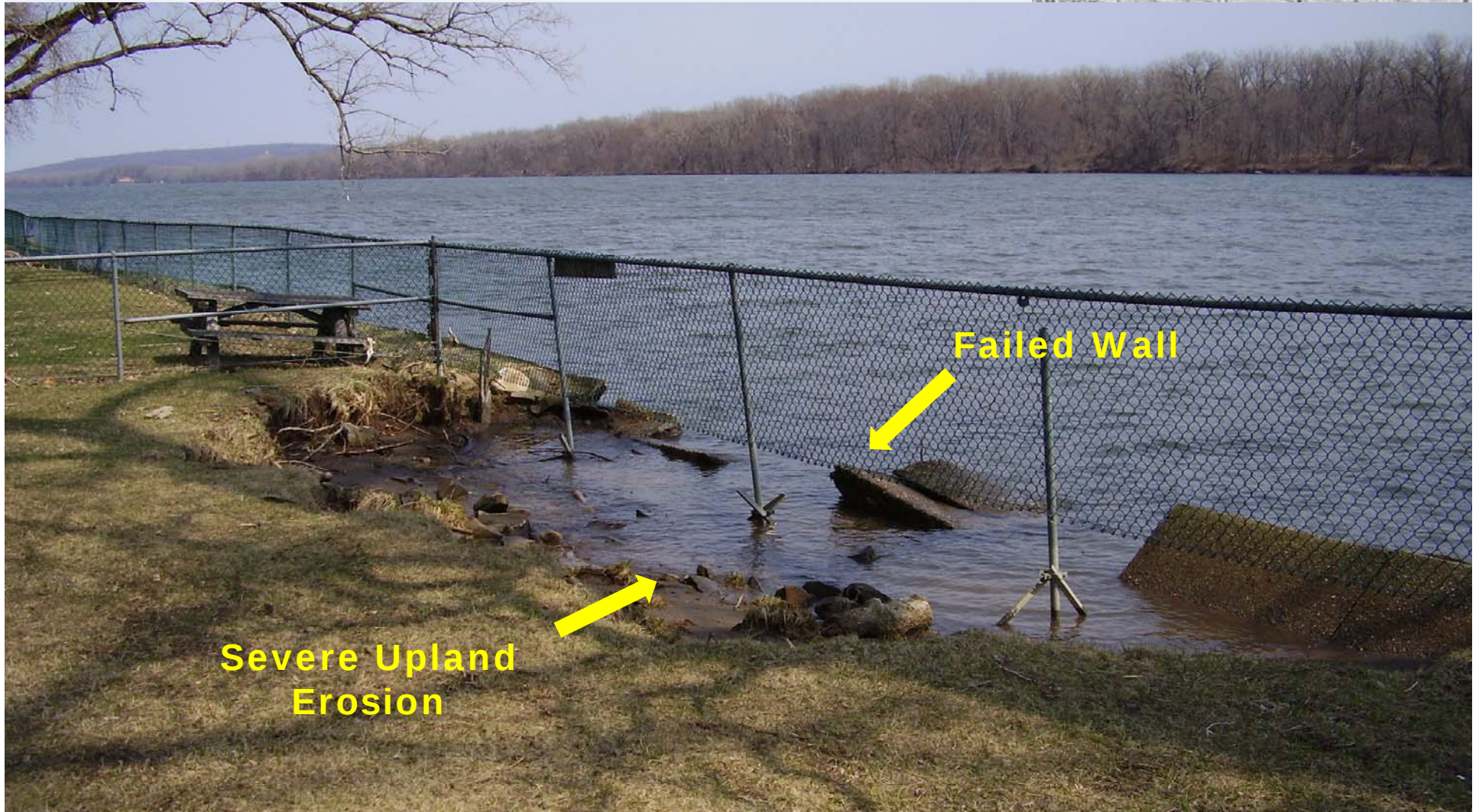


Segment G
"Large Group Picnic Area 2 & Fire Dock"



Existing Conditions

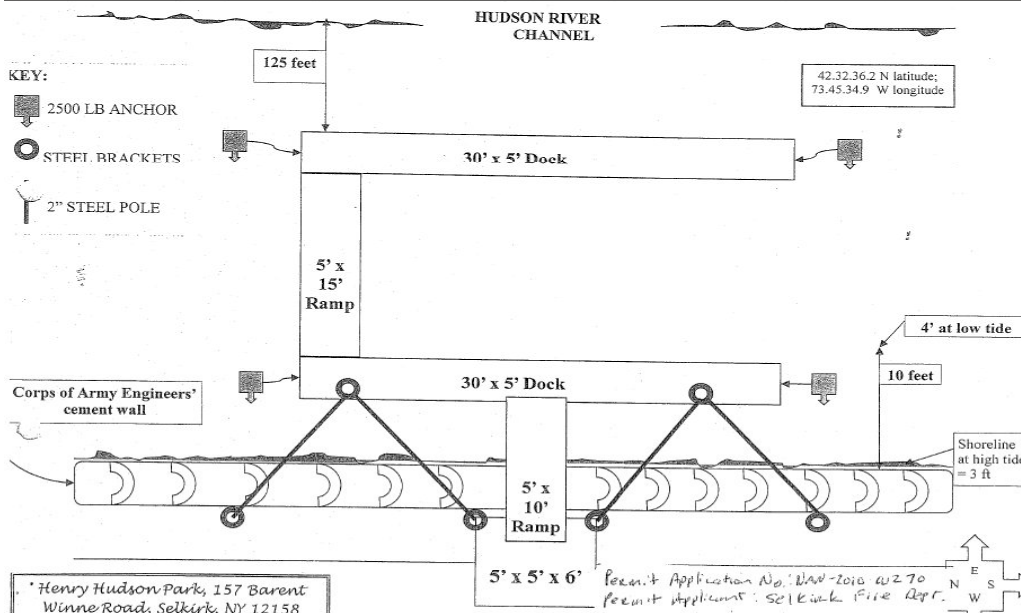
Segment G – "Large Group Picnic Area 2"



Future Use

Segment G – "Large Group Picnic Area 2"

Fire Dock – Bethlehem Fire Department



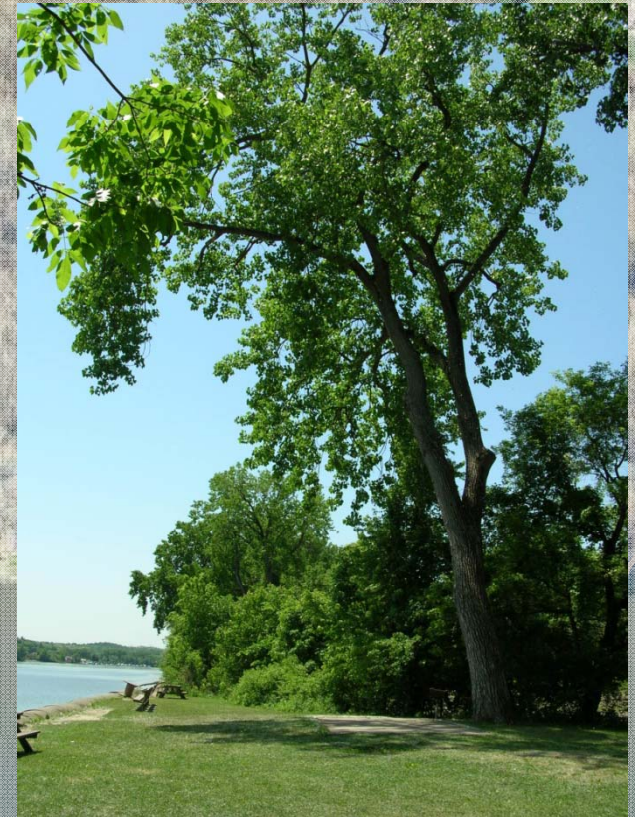
Quick Road Access



Shoreline Inventory – Segment H

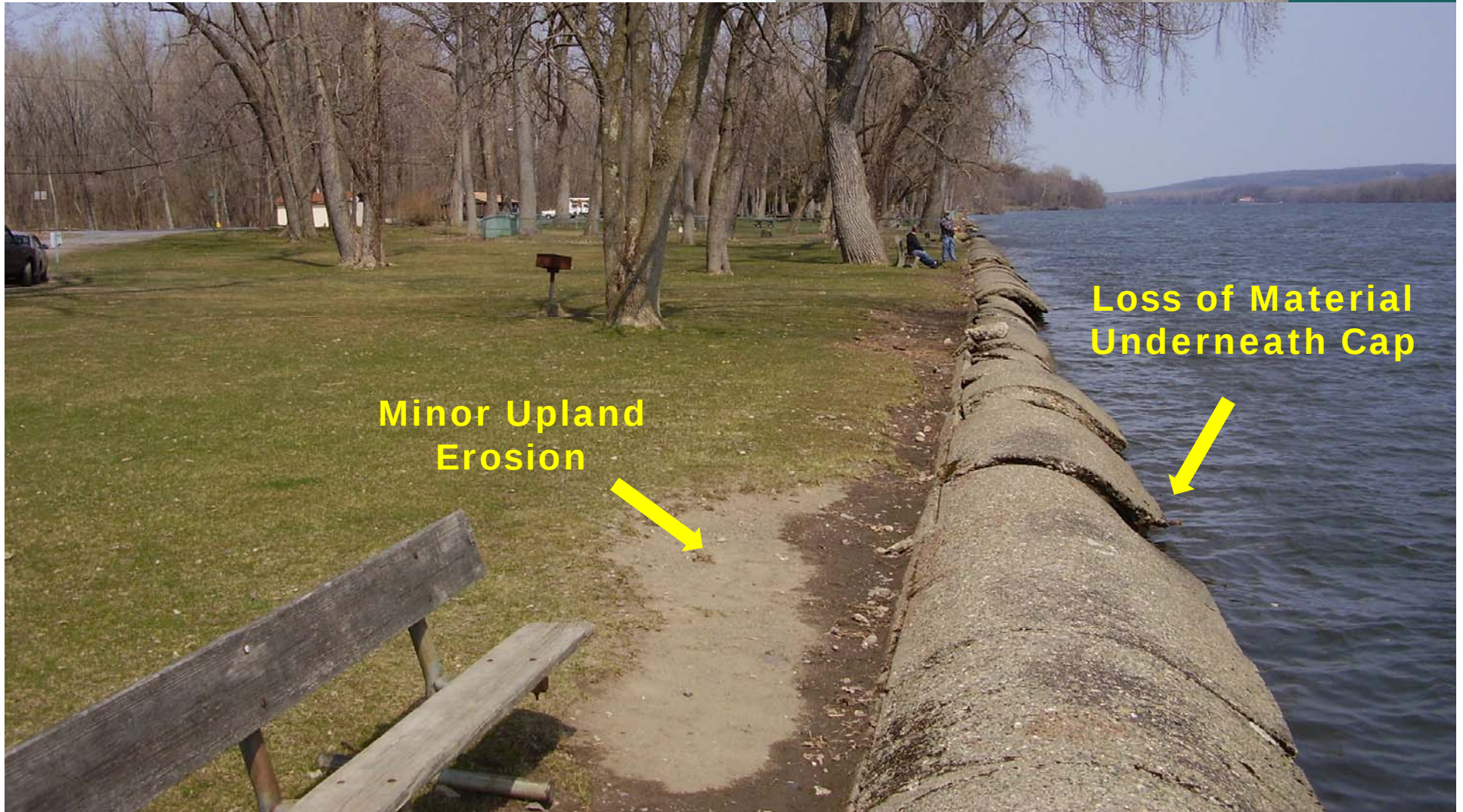


Segment H
"Large Group Picnic Area 3"



Existing Conditions

Segment H – "Large Group Picnic Area 3"



Shoreline Recommendations

ROCK RIPRAP REVETMENT



★ HIGH PRIORITY

Segment C – "Fishing Platform Area"

Segment D – "Picnic Area"

Segment G – "Large Group Picnic Area 2"

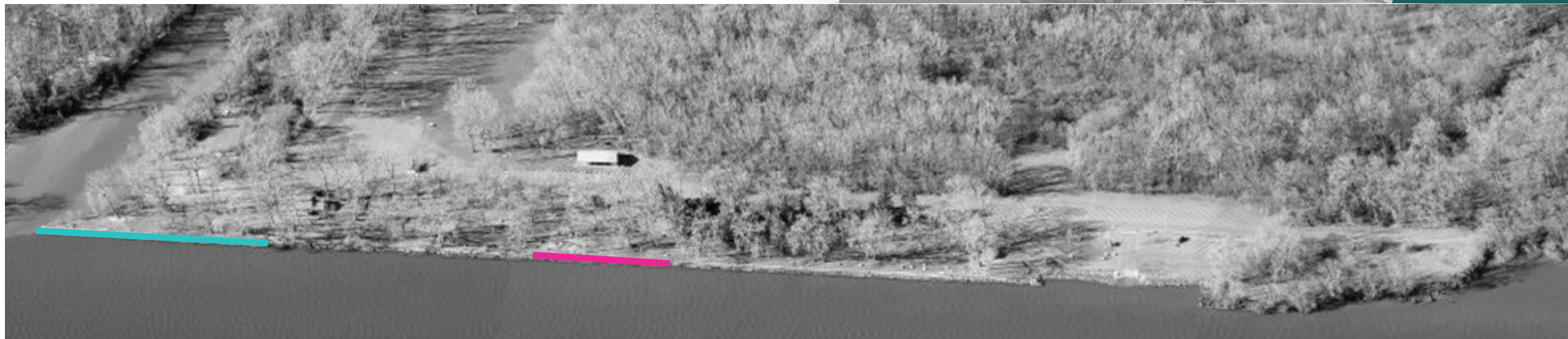
★ MEDIUM HIGH PRIORITY

Segment F – "Large Group Picnic Area 1"



Shoreline Recommendations

JOINT PLANTING



★ HIGH PRIORITY

Segment E – "Play Area"

★ MEDIUM PRIORITY

Segment H – "Large Group Picnic Area 3"



Shoreline Recommendations

SOFT VEGETATION



★ HIGH PRIORITY

Segment A1 – Northern Section of "Overlook Area"

★ LOW PRIORITY

Segment A2 – Southern Section of "Overlook Area"

Shoreline Recommendations

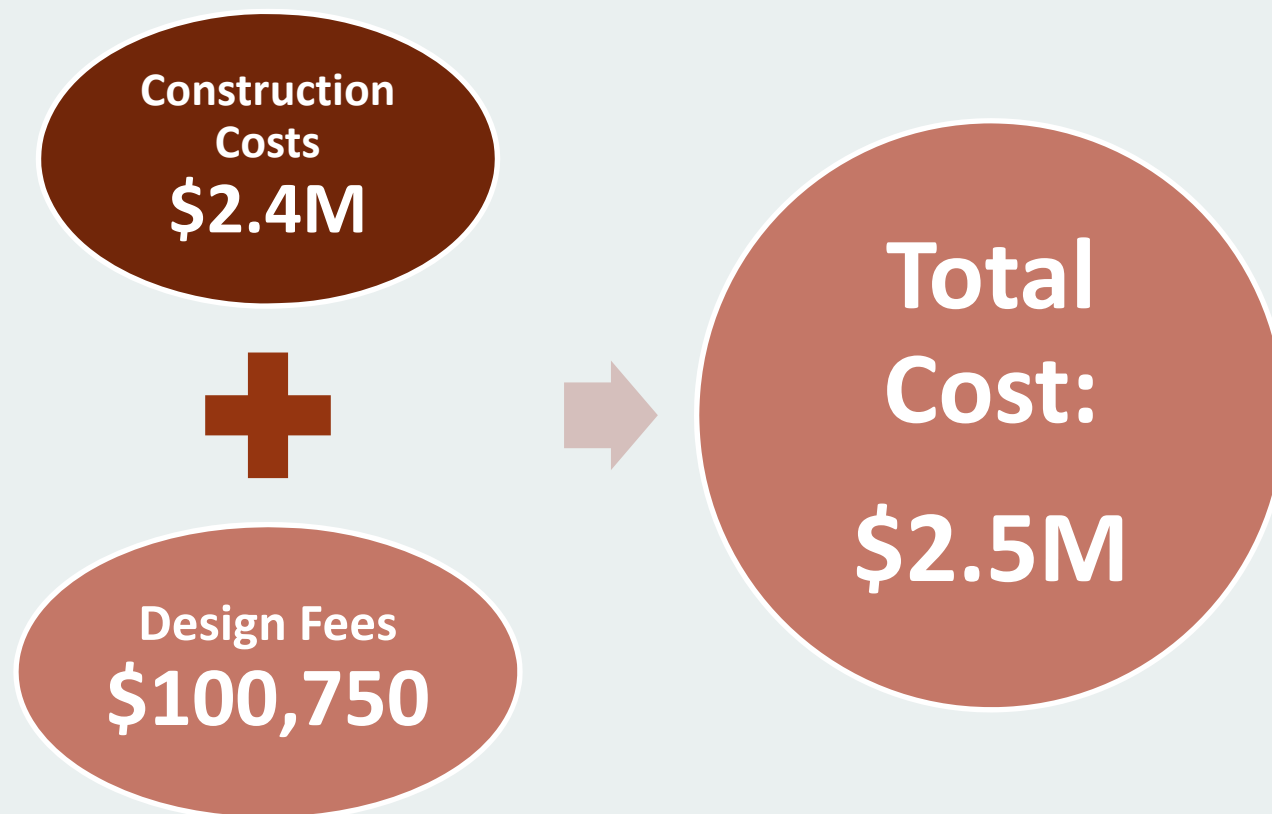
SOFT VEGETATION – SEGMENT A1



1. Restrict Pedestrian Access
2. Cut Back Slope (to a 30 degree angle)
3. Plant Vegetation
 - **LOWER WATERLINE:** Emergent aquatic plants
 - **MID WATERLINE:** Woody & emergent flood tolerant shrubs
 - **TOP BANK:** Flood tolerant moist soil trees
4. Relocate Kayak Launch Temporarily to Segment B – "Boat Launch" until Segment A stabilizes.

Moving Forward

Opinion of Probable Project Costs

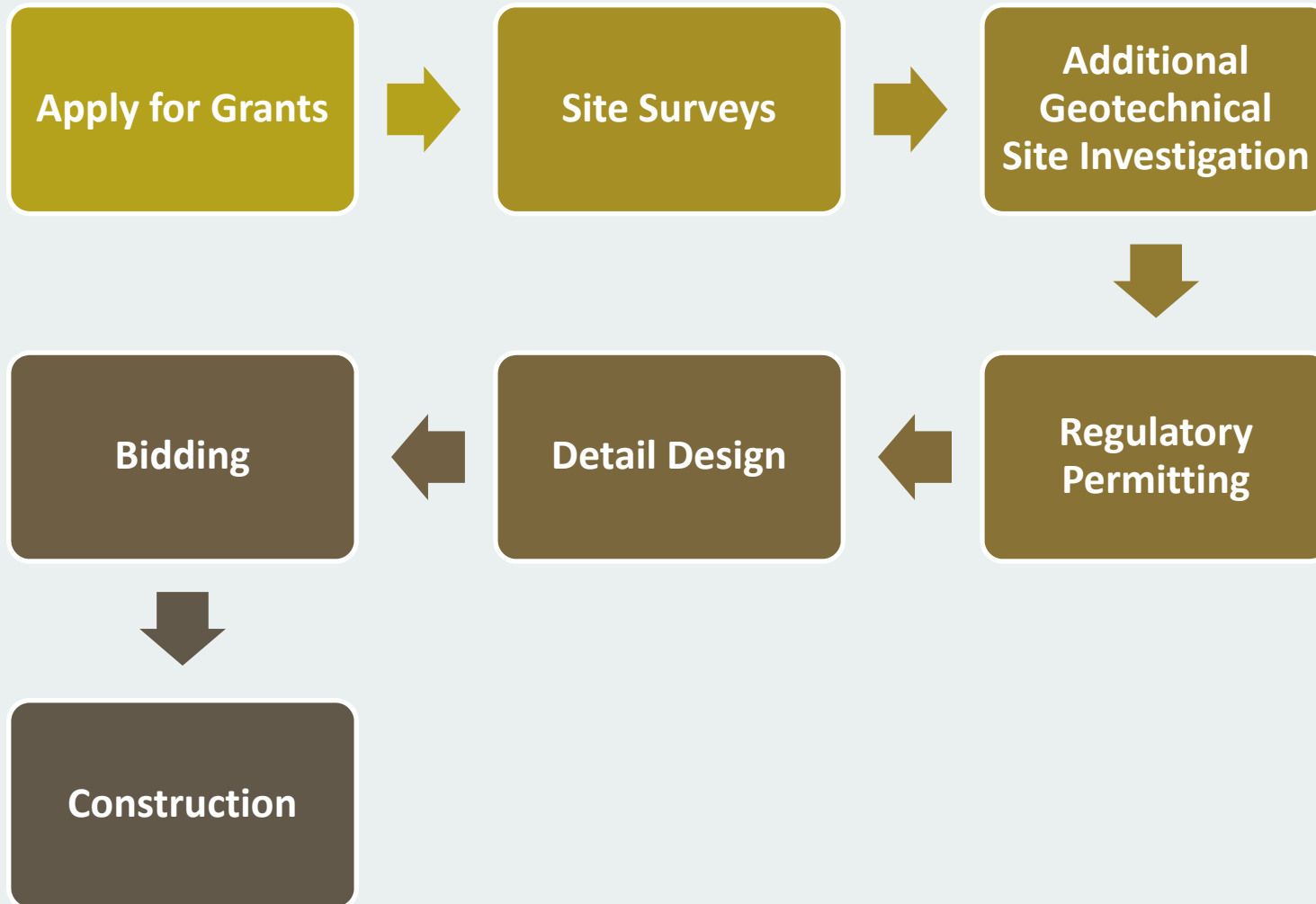


W / O Segment A:

\$1.8M

Moving Forward

Next Project Steps





Any Questions?

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