

Building an Improved Weir Decanting System:

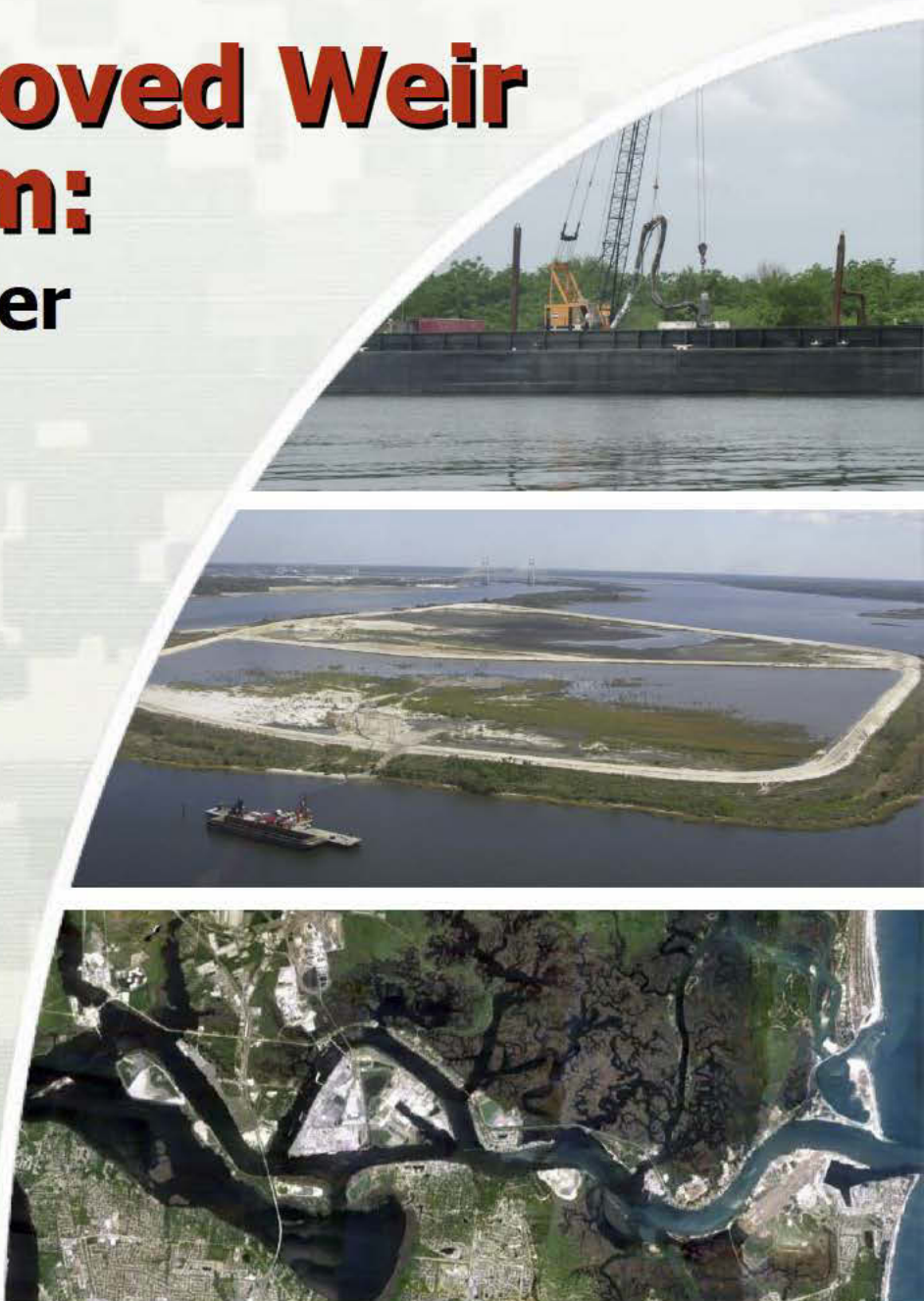
Economical, Safer, Longer Life-Cycle and with Environmental Provisions

Engineering Division
Jacksonville District

Presentation for
Designing Navigation Infrastructure:
Toward Greater Environmental
Sustainability

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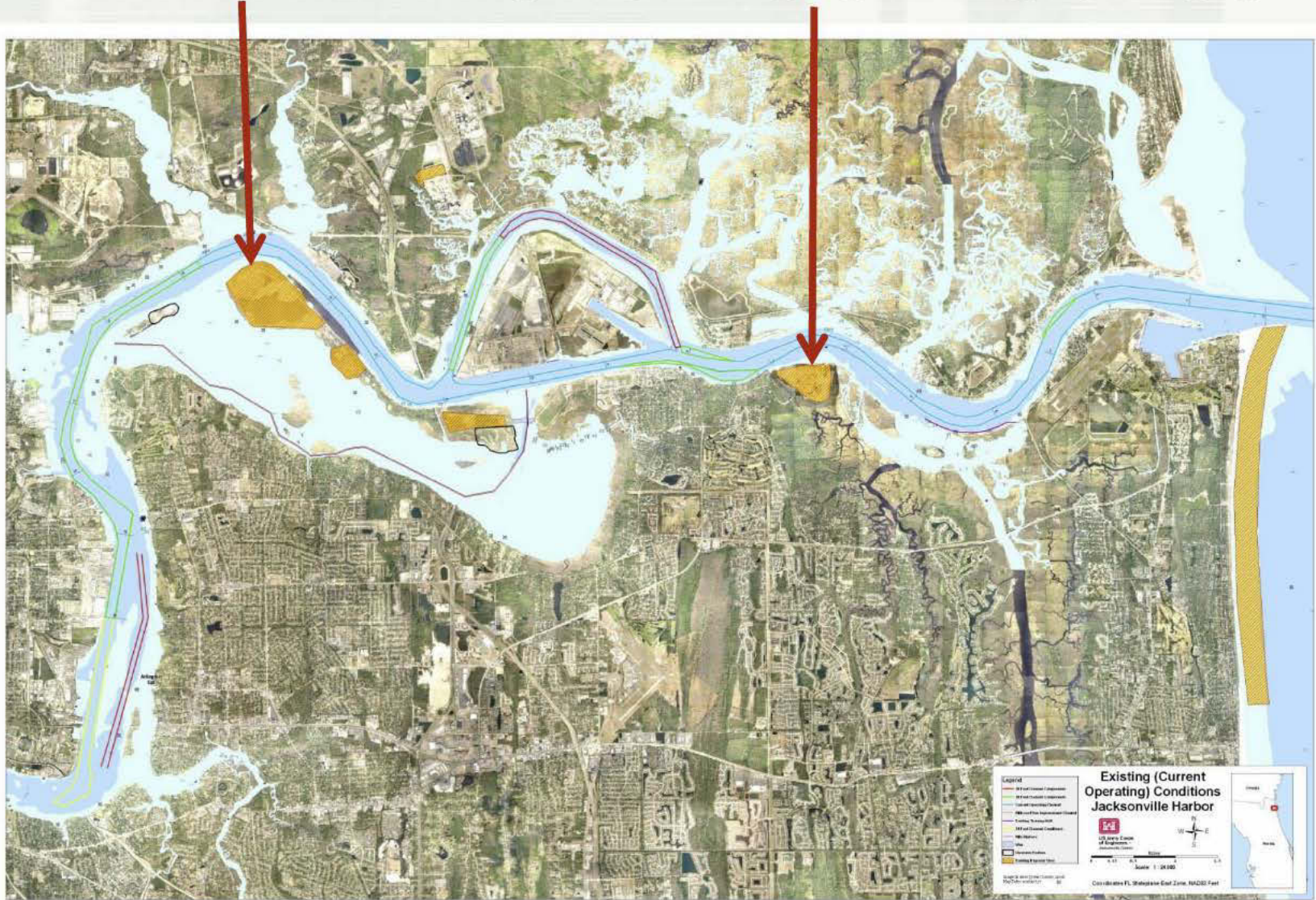


OUTLINE

- **Background**
- **Example Projects - Design Features**
 - Resource Avoidance
 - Shoreline Plantings
 - Wavebreak
 - Drainage Blanket
- **Environmental Safety Measures**
 - Improved Weir System Design
 - Box Riser
 - Composite Weir Boards
 - Floating Docks Access
 - Emergency Shutoff Flap Gates
 - HDPE Outfall Pipes
- **Less Expensive and Safer**
 - Life-cycle
 - Cost
 - Safety

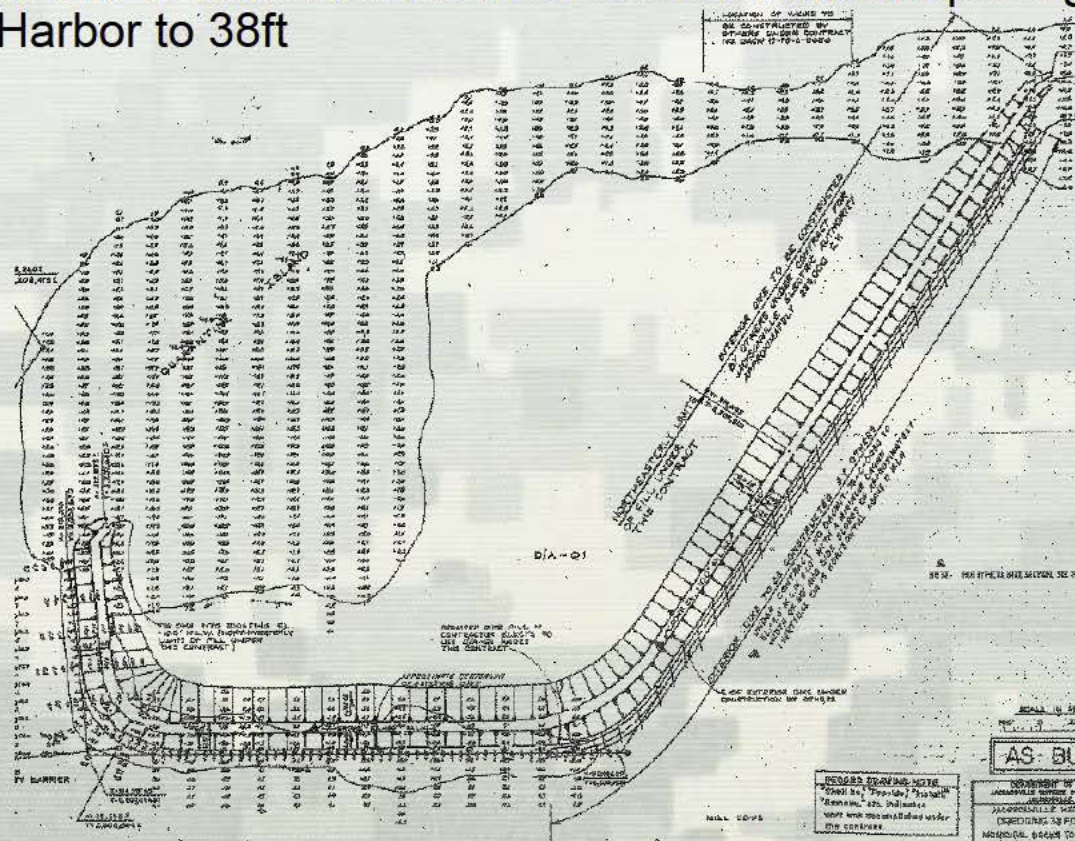


BARTRAM and BUCK Islands



BARTRAM ISLAND

- **1895**
 - Bartram (Quarantine) Island appears on survey maps as dredge spoils area
- **1974**
 - Dikes of Cell A and B were created to el. 8.5 ft for the deepening of Jacksonville Harbor to 38ft



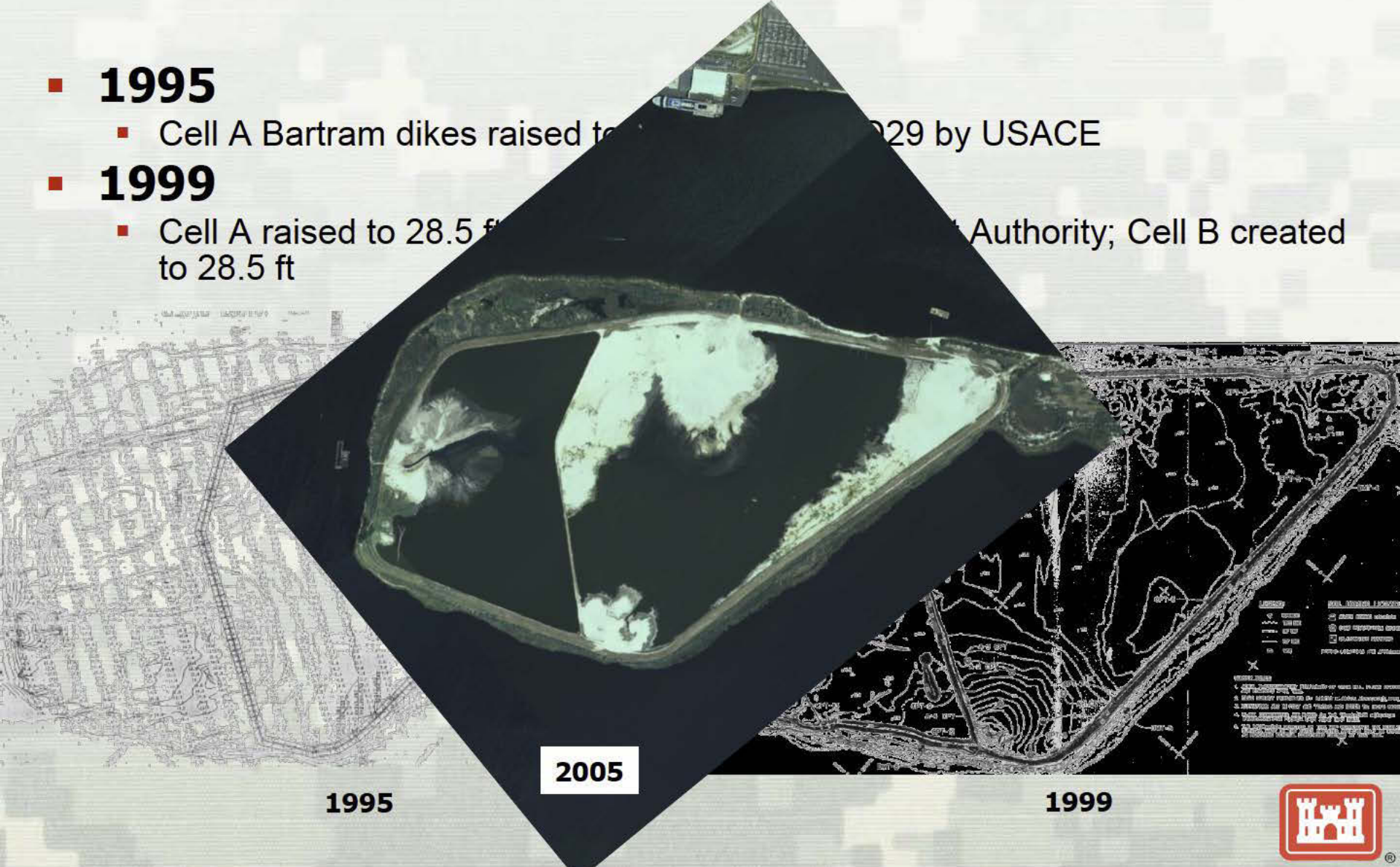
BARTRAM ISLAND

- **1995**

- Cell A Bartram dikes raised to 29 ft by USACE

- **1999**

- Cell A raised to 28.5 ft by Water Authority; Cell B created to 28.5 ft



1995

2005

1999



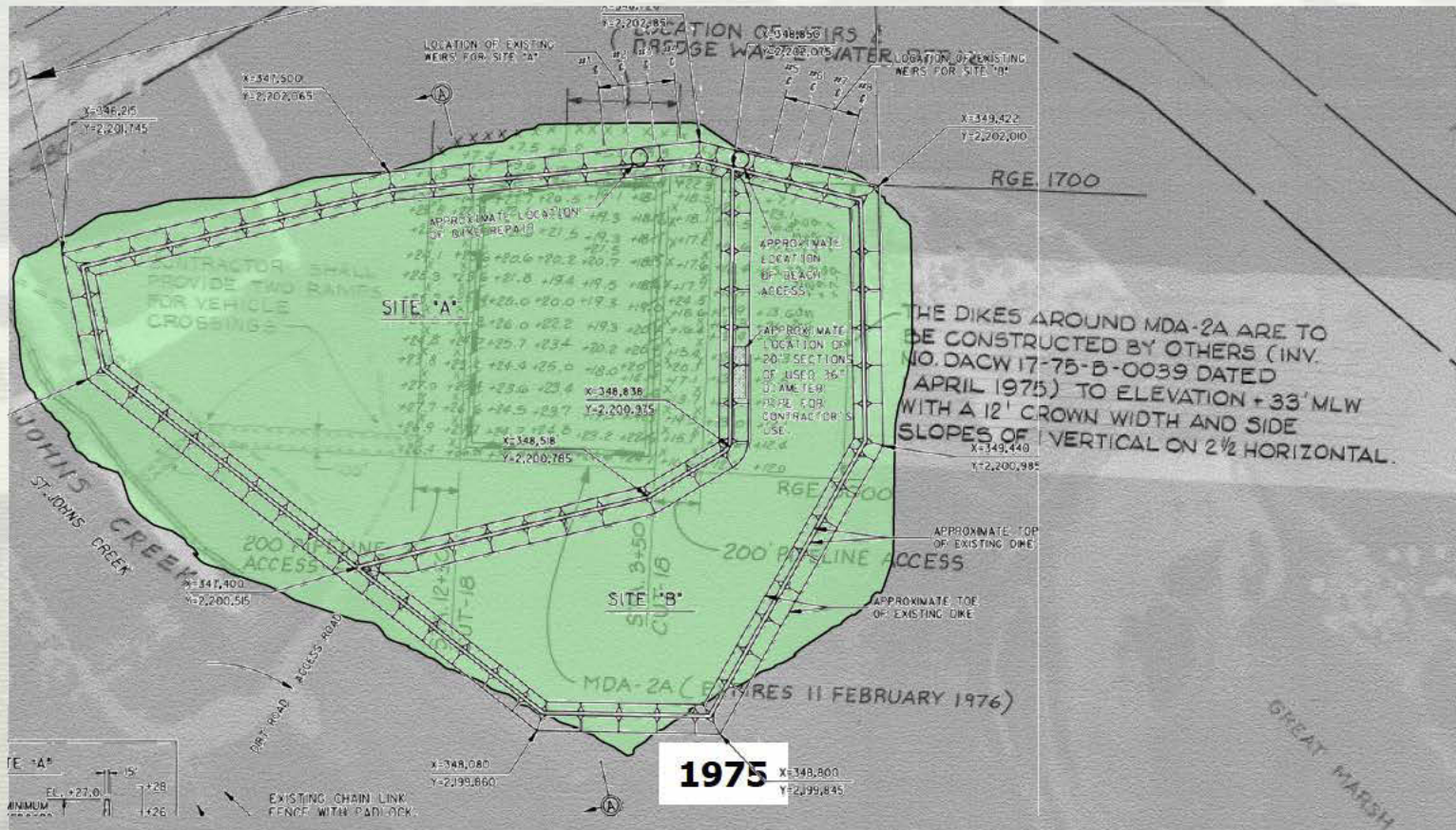
BARTRAM ISLAND

Fringe Marsh Develops



BUCK ISLAND

- **1975** - Confined disposal facility created by local Sponsor
- **1985** - Existing DMMA footprint created
- **1997** - Dikes raised to el. 37 ft by Port



BUCK ISLAND

Corrugated half-pipe riser weir



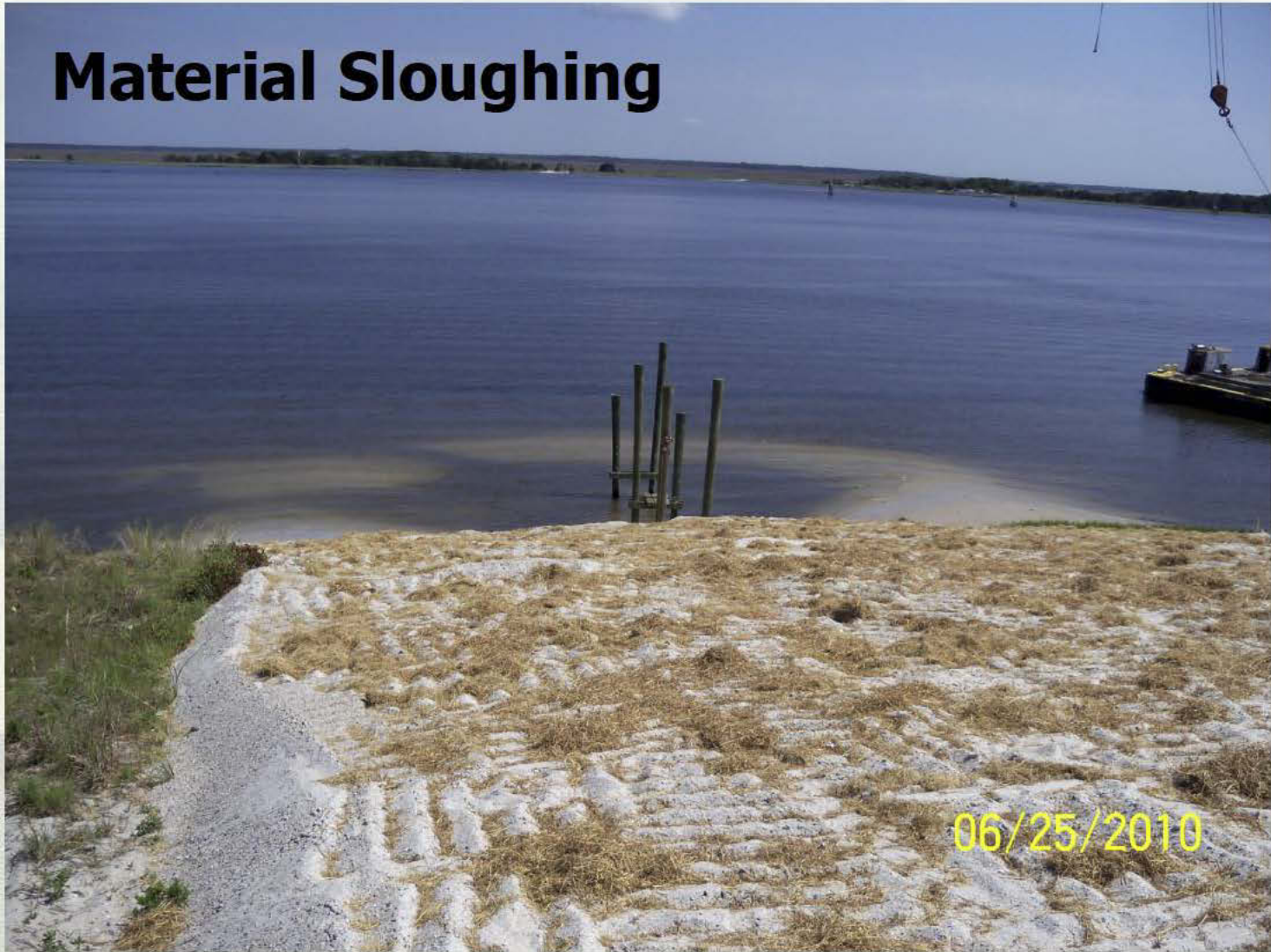
BUCK ISLAND

Shoreline Erosion



BUCK ISLAND

Material Sloughing

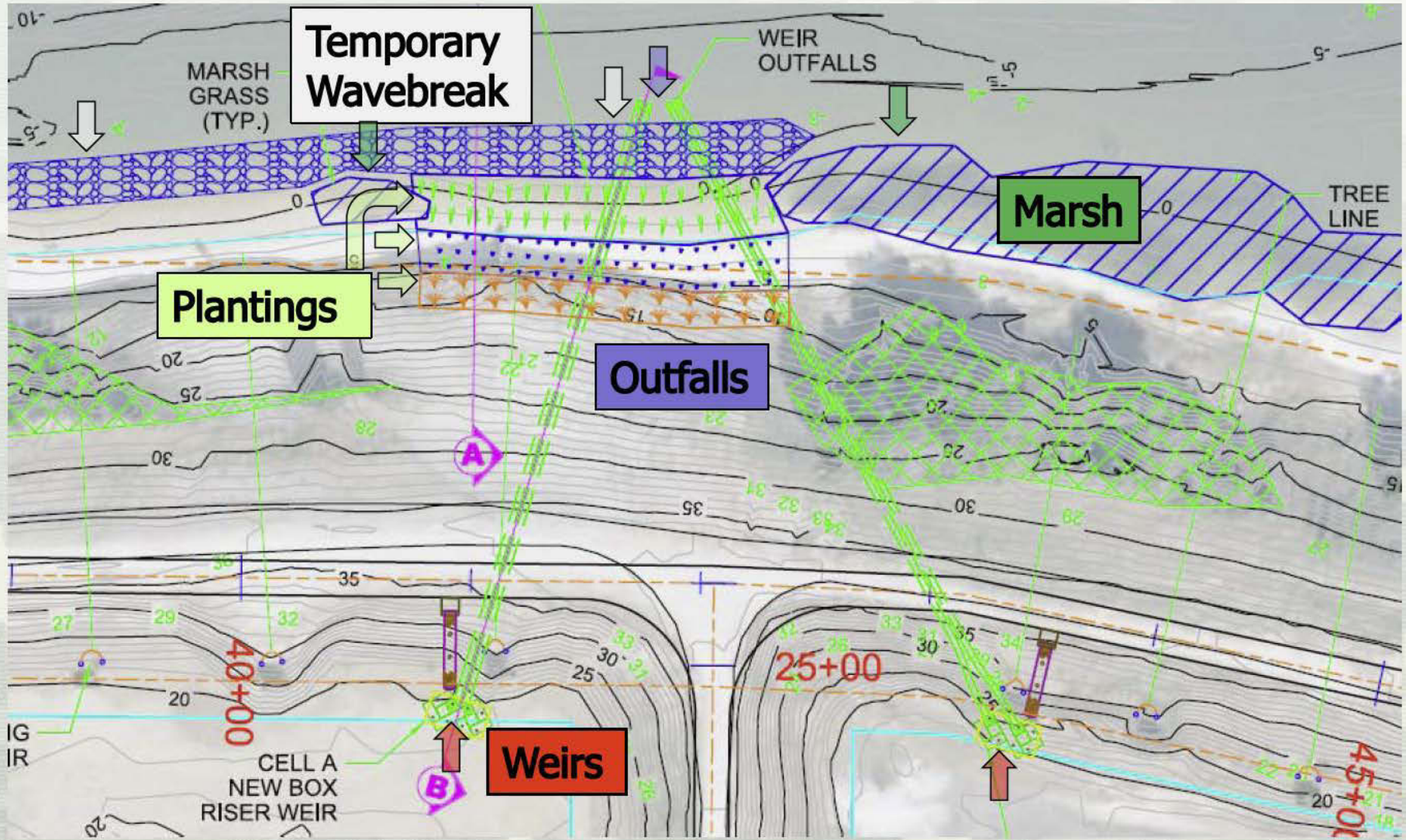


BUCK ISLAND

Shoreline Erosion



BUCK ISLAND

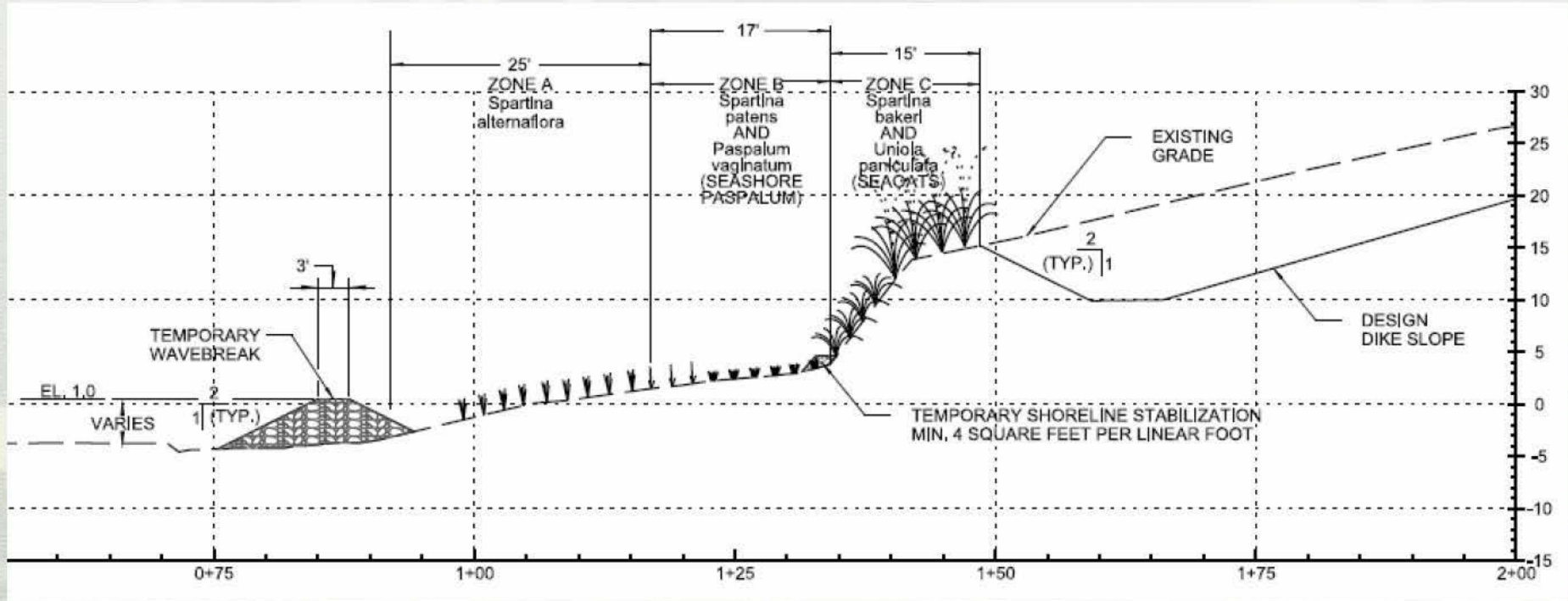


• **Shoreline Planting for Stabilization and Enhancement**



BUCK ISLAND

Shoreline Restoration



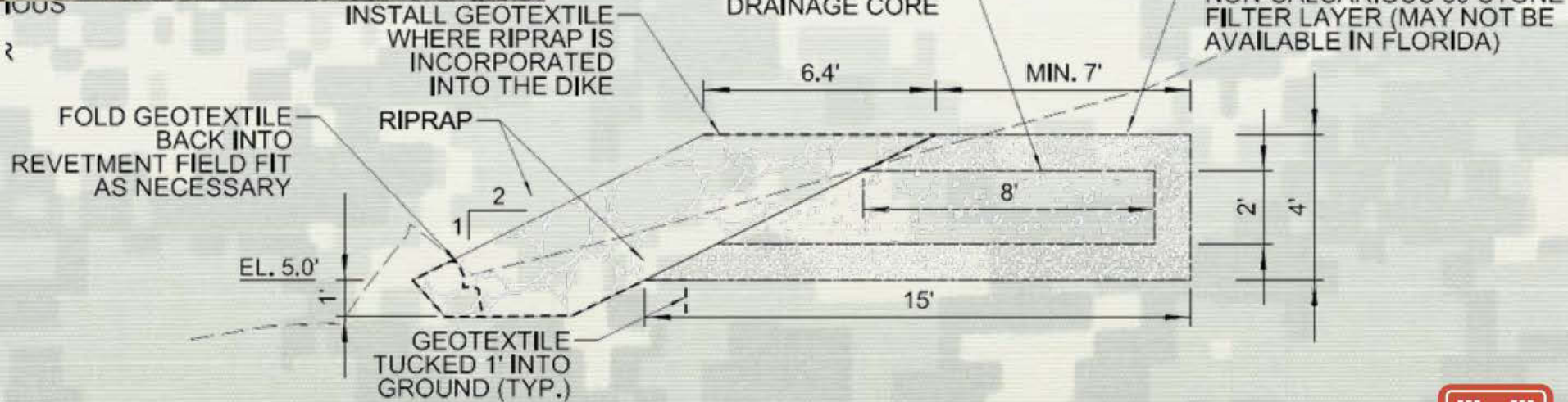
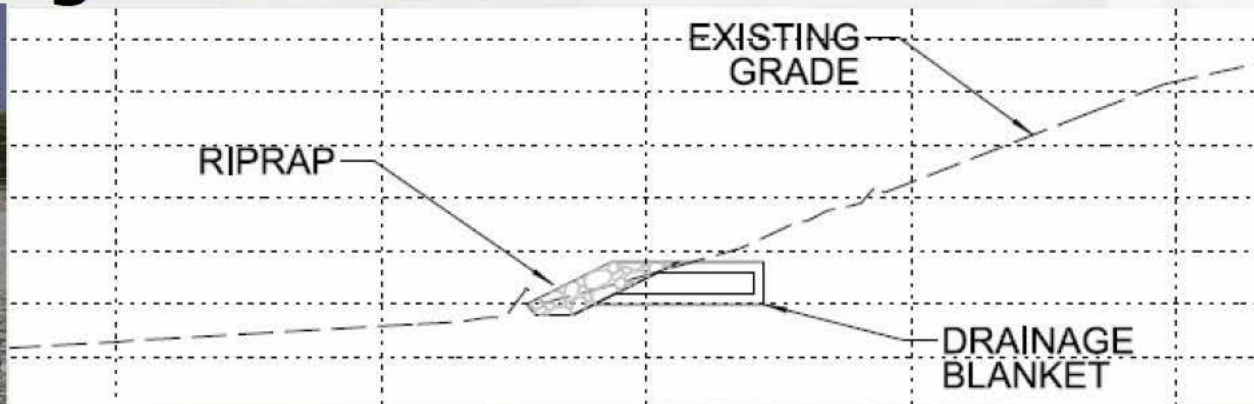
BUCK ISLAND

Shoreline Erosion



BUCK ISLAND

Shoreline Drainage Blanket



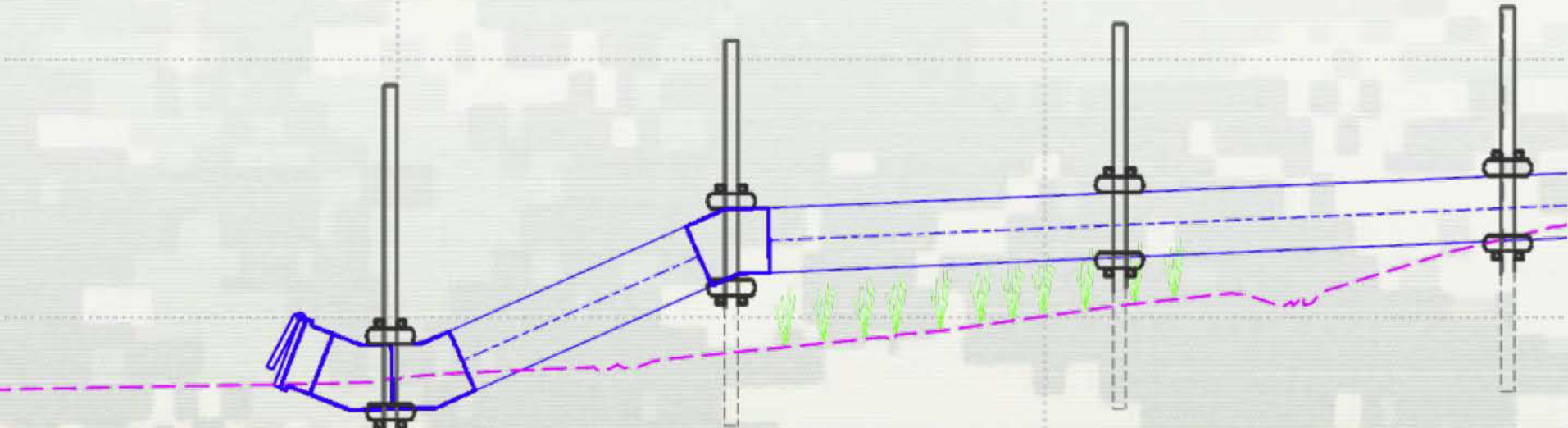
DRAINAGE BLANKET WITH RIP RAP - DETAIL

NTS



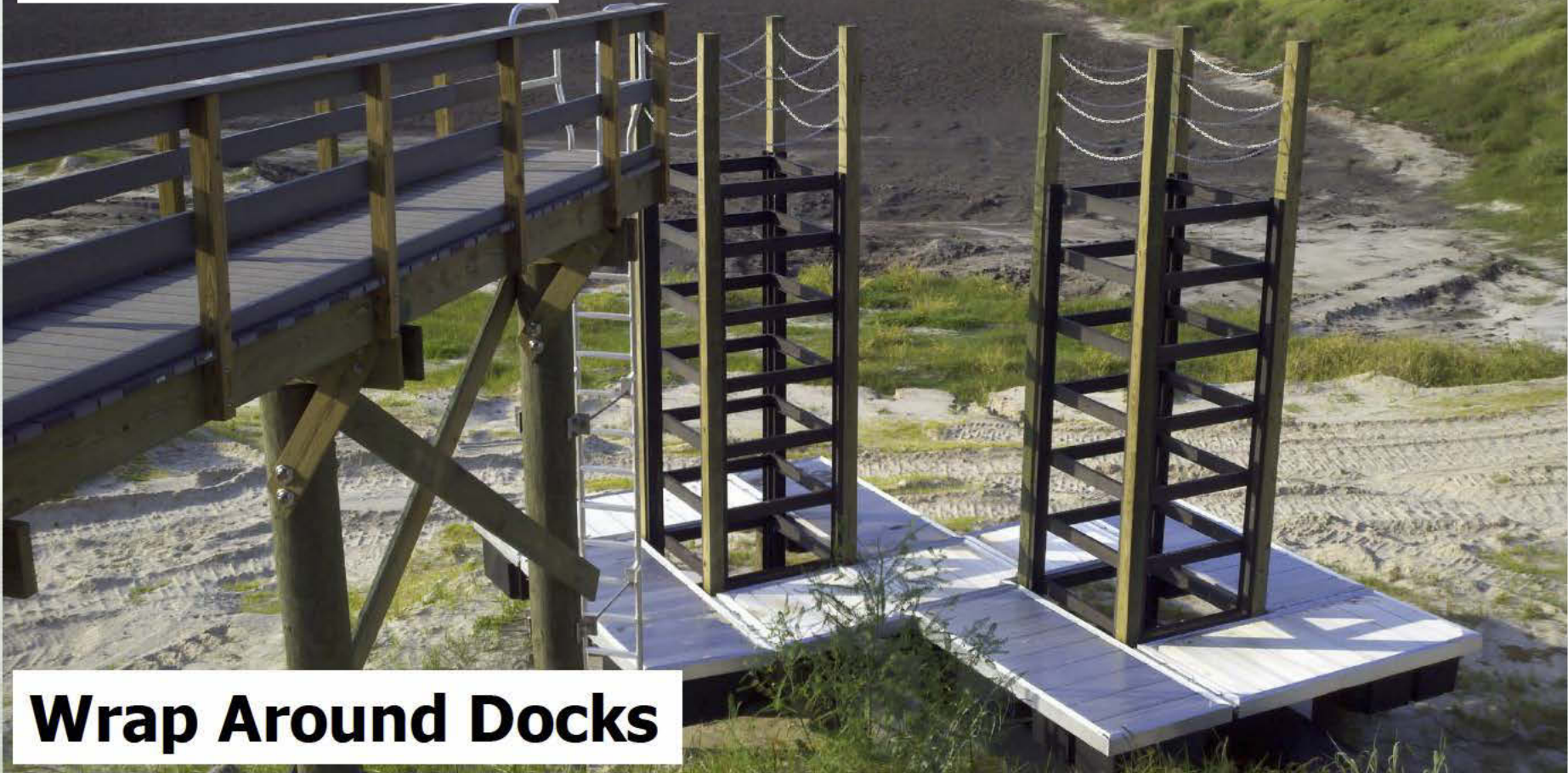
BARTRAM ISLAND

Elevated pipeline to avoid resources



BUCK ISLAND

Box Riser Weirs

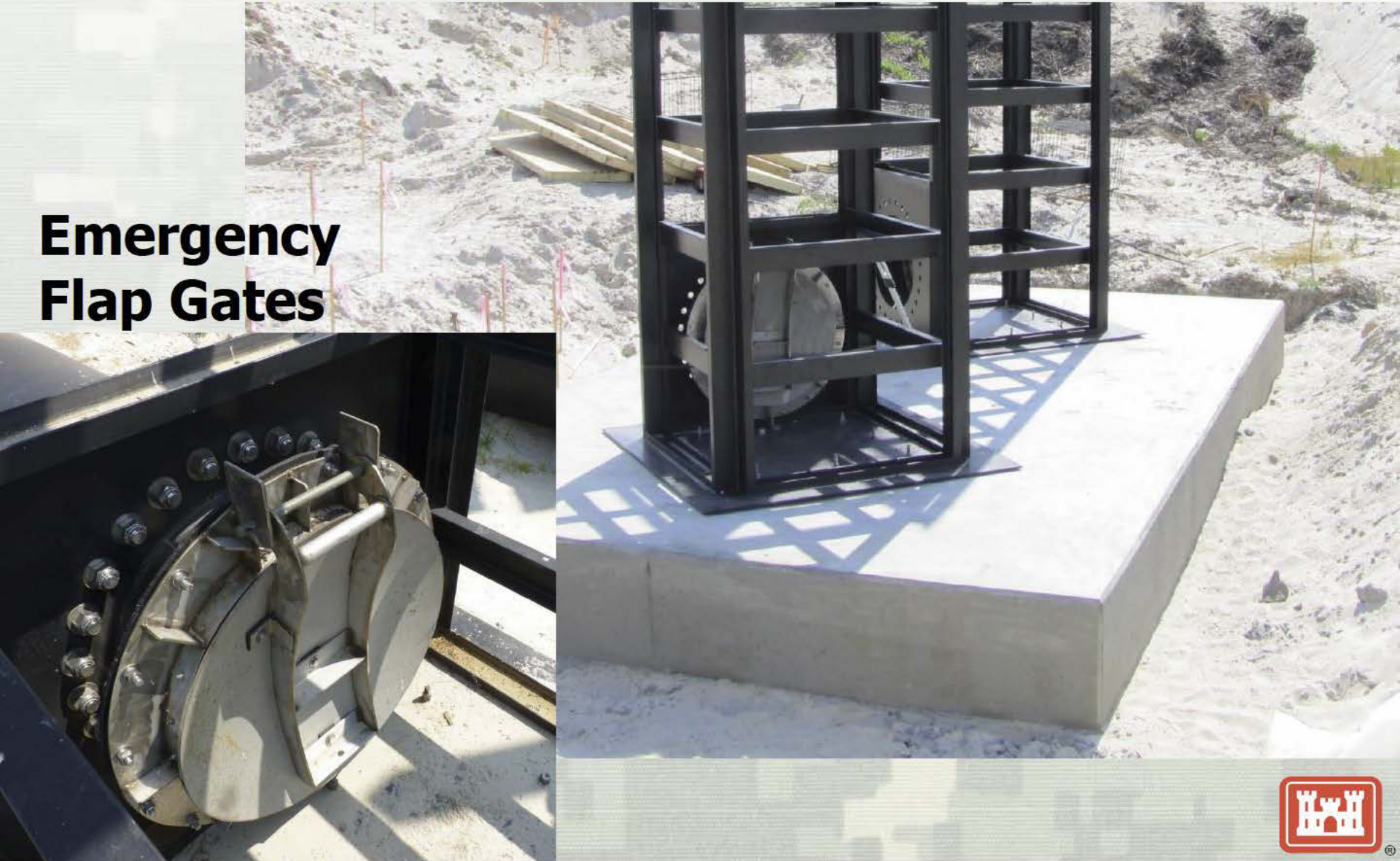


Wrap Around Docks



BUCK ISLAND

**Emergency
Flap Gates**



BUCK ISLAND



**HDPE
Outfall Pipes**



SITE TO REMAIN NAMELESS

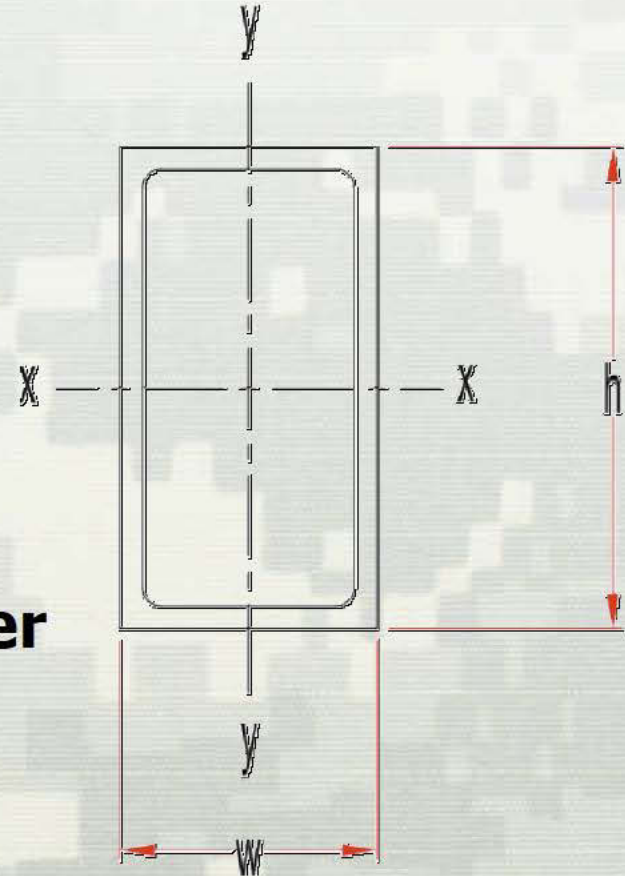


Composite Weir Boards



COMPOSITE WEIR BOARDS

- **Stronger**
- **Hollow Core**
- **Lighter = Safer**
- **Better fit = less turbidity**
- **1.8 times denser than water**



VALUE ENGINEERING STUDY

▪ Assumptions

- 2 Half-Pipe Riser Projects – Corrugated Steel
 - 10 yr life
 - ~ \$715,000
- 3 Box Riser Projects – Coal Tar Epoxy Steel
 - 25 yr life
 - ~ \$514,000
- Overall Life Cycle of 50 years
- Includes \$100K Misc. Design Cost
- Federal Discount Rate 4.125%



LIFE CYCLE COST COMPARISON

- **Costs**

- Initial Cost Savings

- ~\$201,000

- Life cycle Savings

- ~\$1,216,000

- **Total Initial and Life Cycle Savings**

- ~\$1,417,000



LIFE CYCLE COST STAINLESS STEEL

- **Assuming**

- Stainless Steel Box Riser Weir System
- Overall Life Cycle of 50 years

- **Costs**

- Initial Cost
 - ~\$593,000
- Life cycle Savings
 - ~\$1,362,000
- **Total Initial and Life Cycle Savings**
 - ~\$1,484,000



SUMMARY



- **Example Projects**

- Resource Avoidance
- Shoreline Plantings
- Wavebreak
- Drainage Blanket

- **Improved Weir System Design**

- Box Riser
- Composite Weir Boards
- Floating Docks Access
- Emergency Shutoff Flap Gates
- HDPE Outfall Pipes

- **Value Engineered**

- Life-cycle
- Cost
- Safety





Questions

