

Building an Improved Weir Decanting System:

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

Engineering Division
Jacksonville District

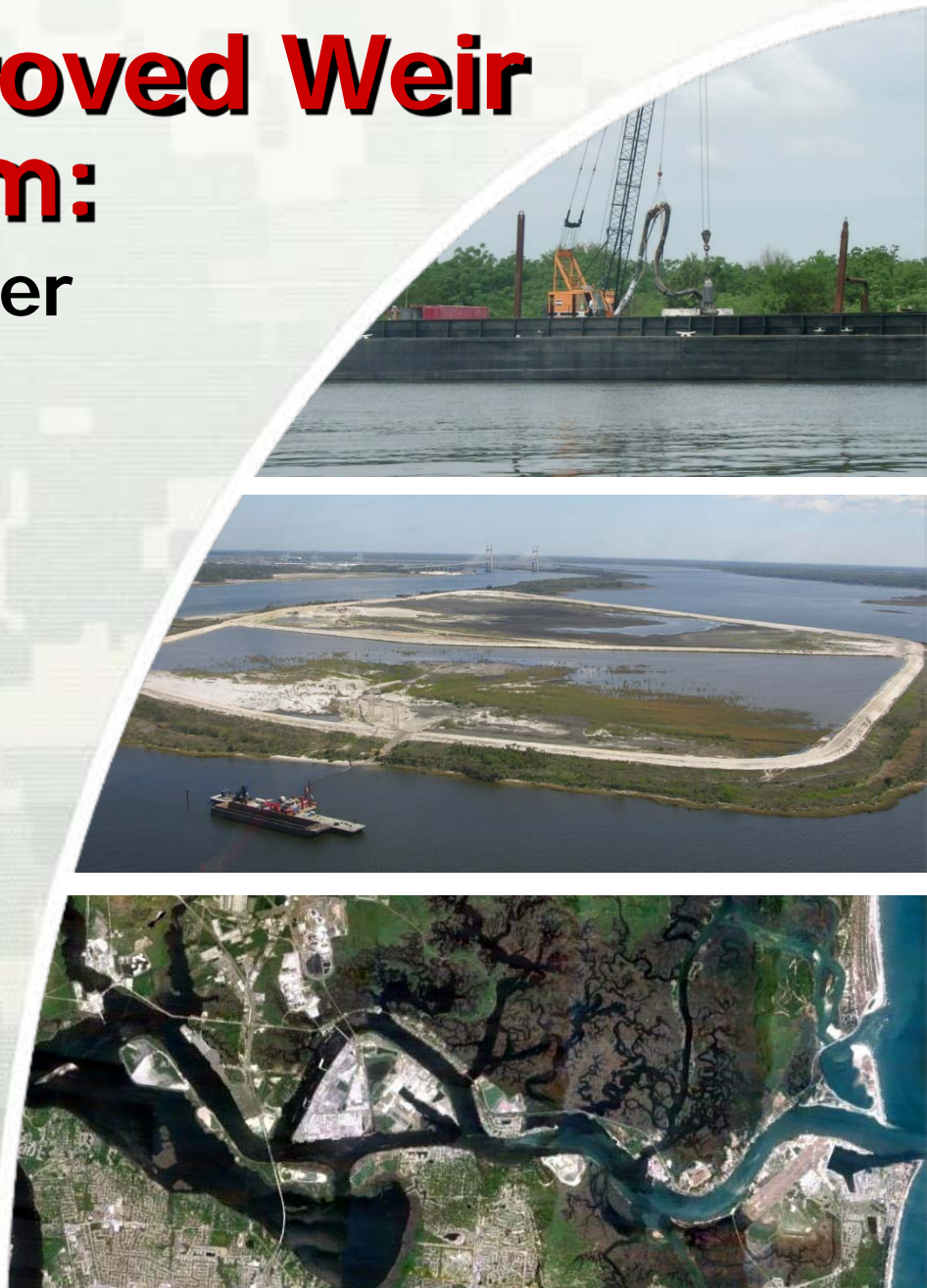
Presentation for
Designing Navigation Infrastructure:
Toward Greater Environmental
Sustainability

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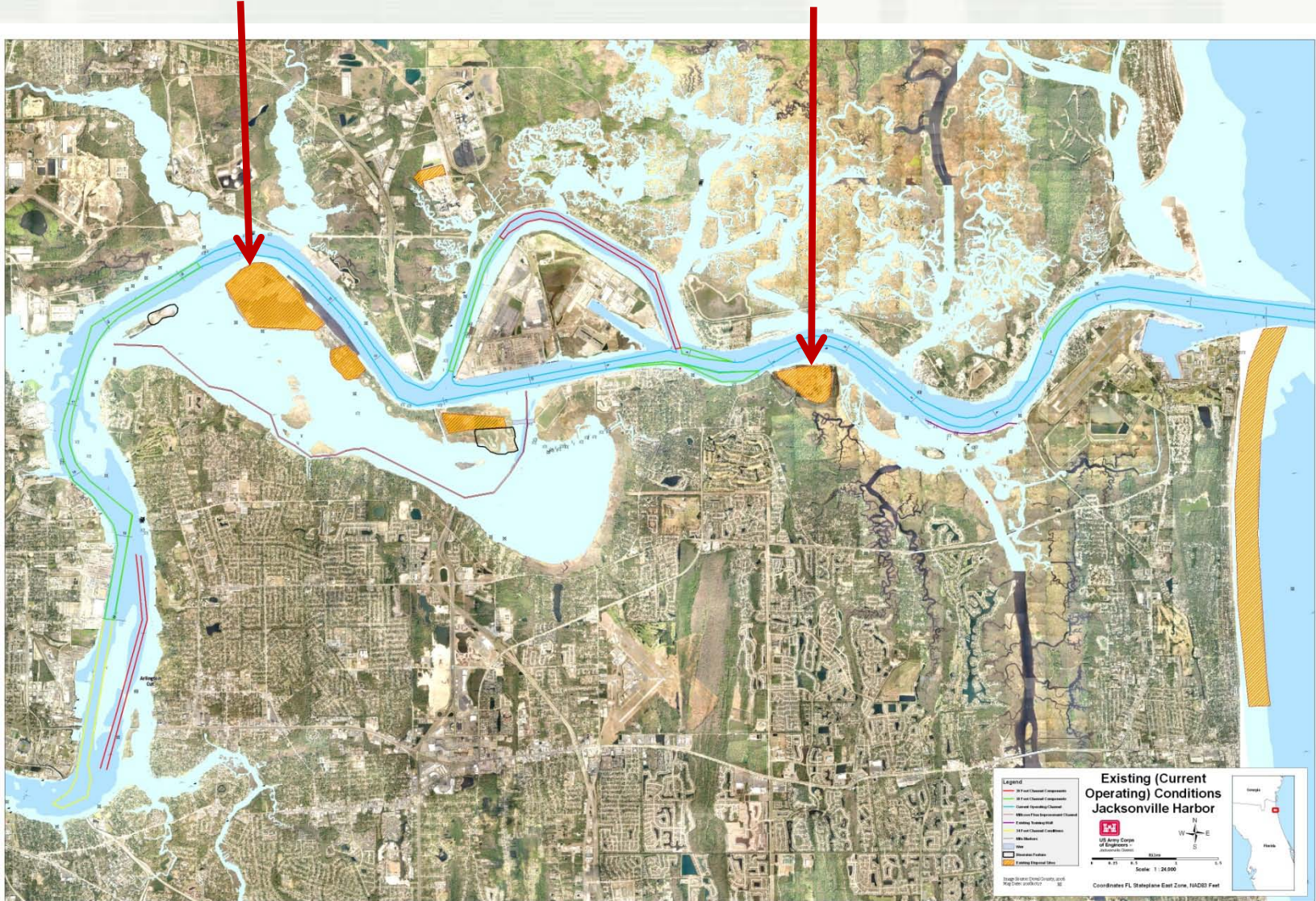


OUTLINE

- **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

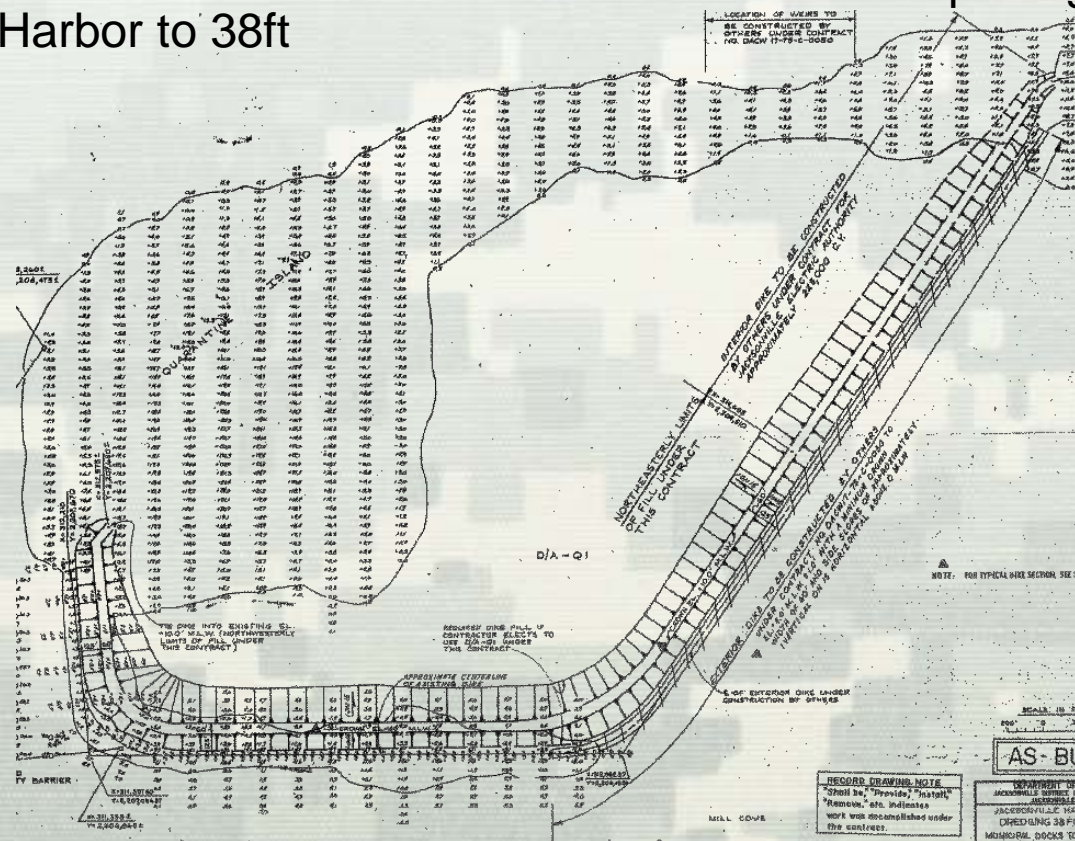


BARTRAM and BUCK Islands



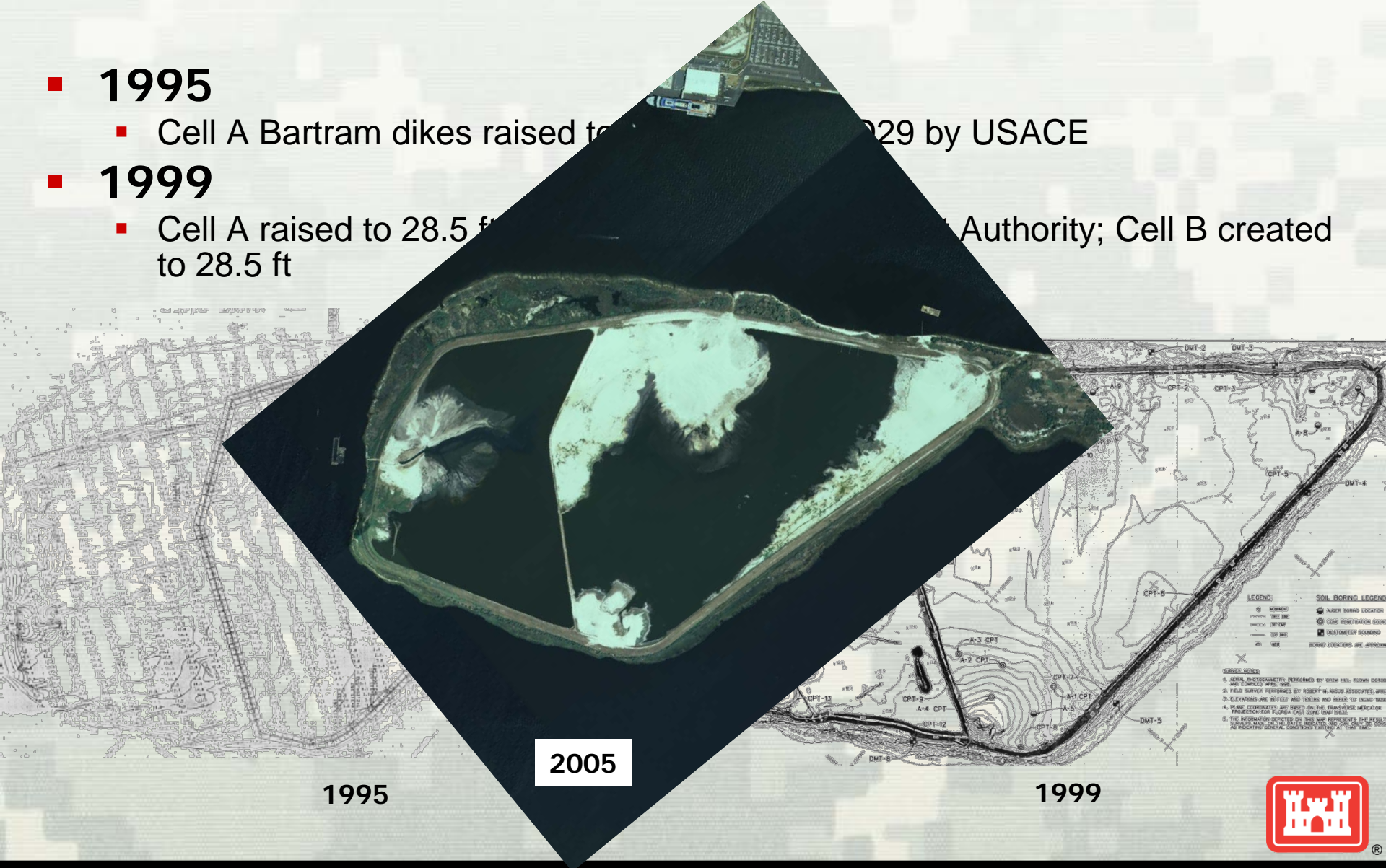
BARTRAM ISLAND

- **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 Army Corps of Engineers; Cell B created to 28.5 ft



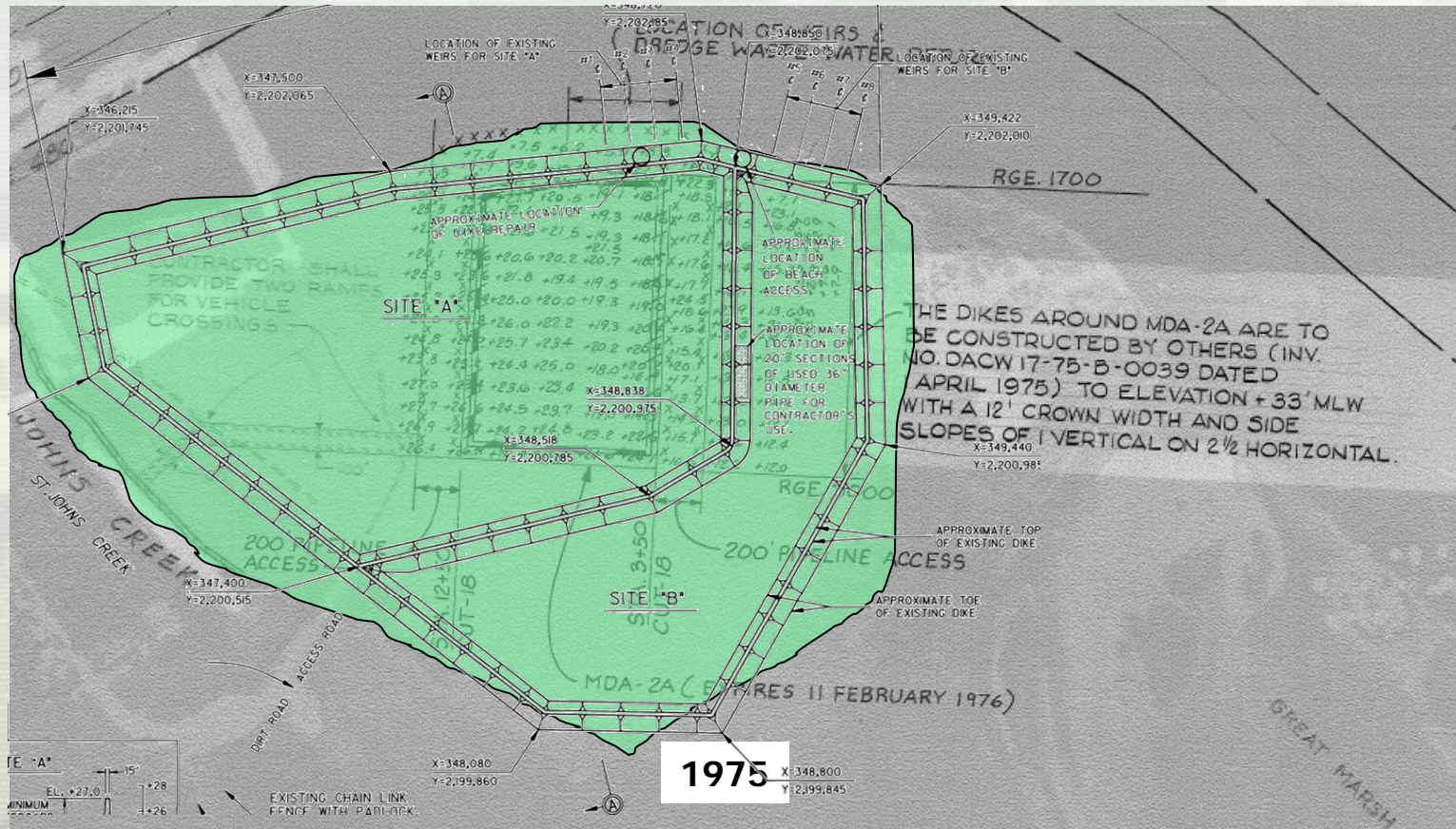
BARTRAM ISLAND

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



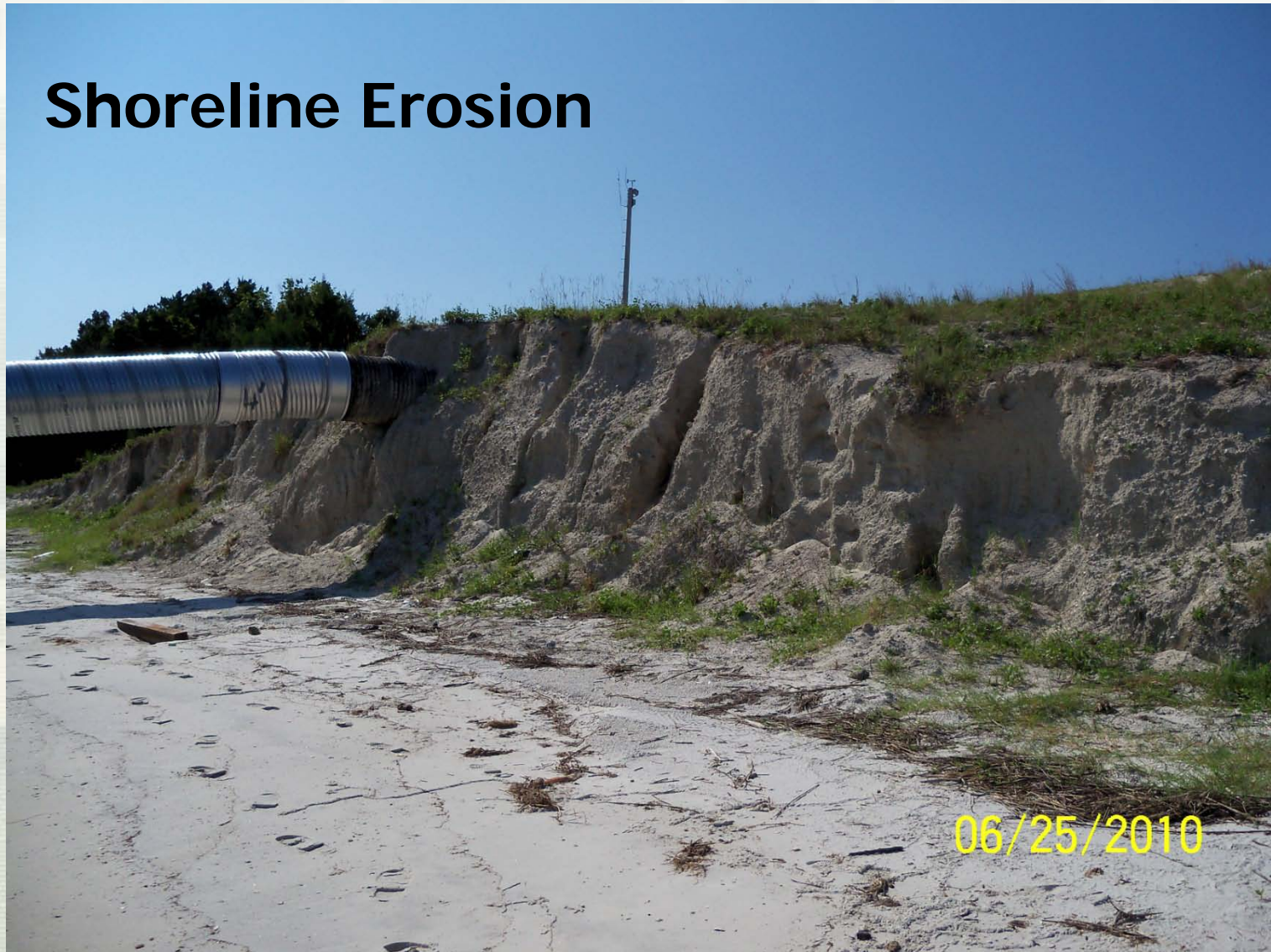
BUCK ISLAND

Corrugated half-pipe riser weir



BUCK ISLAND

Shoreline Erosion



BUCK ISLAND

Material Sloughing

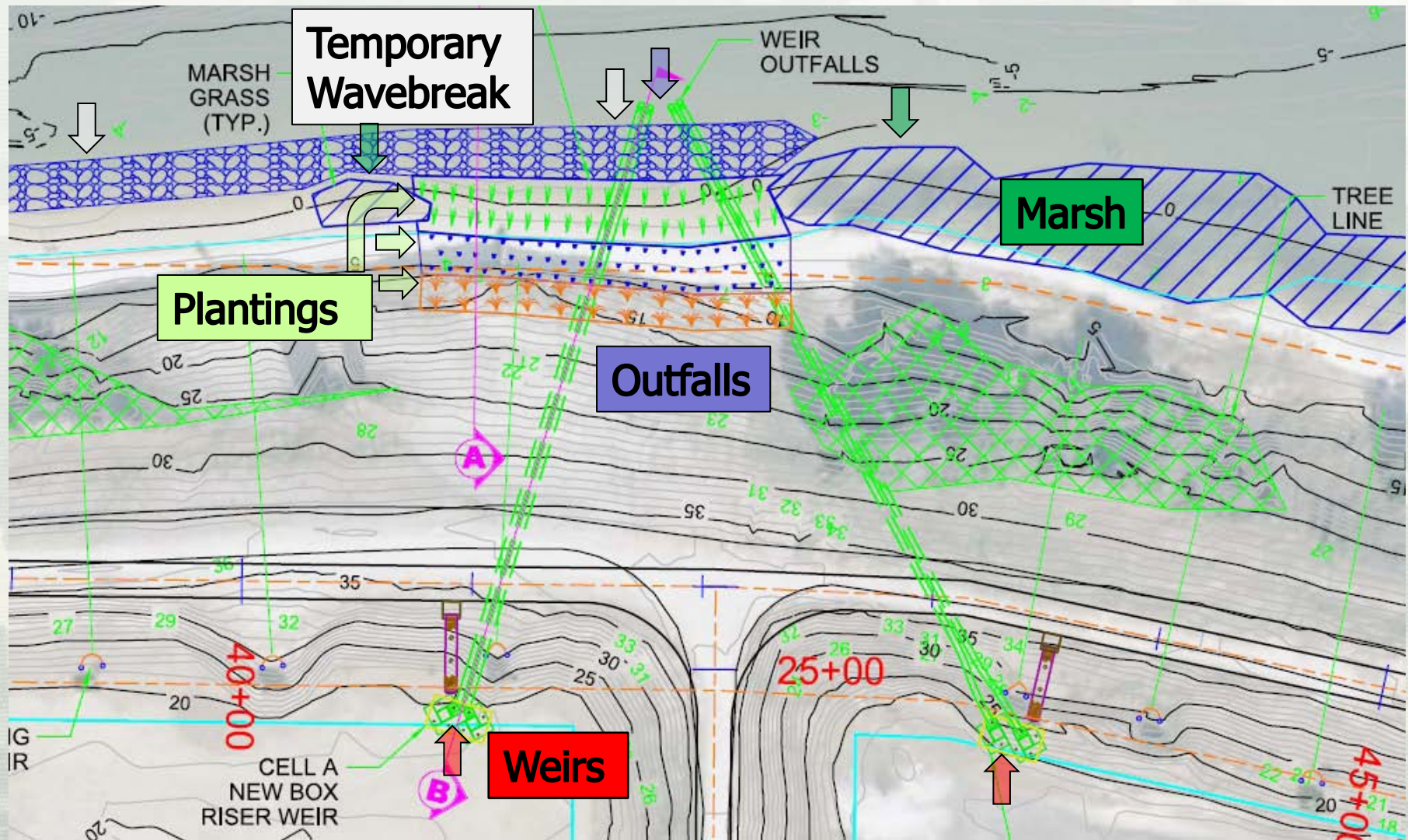


BUCK ISLAND

Shoreline Erosion



BUCK ISLAND

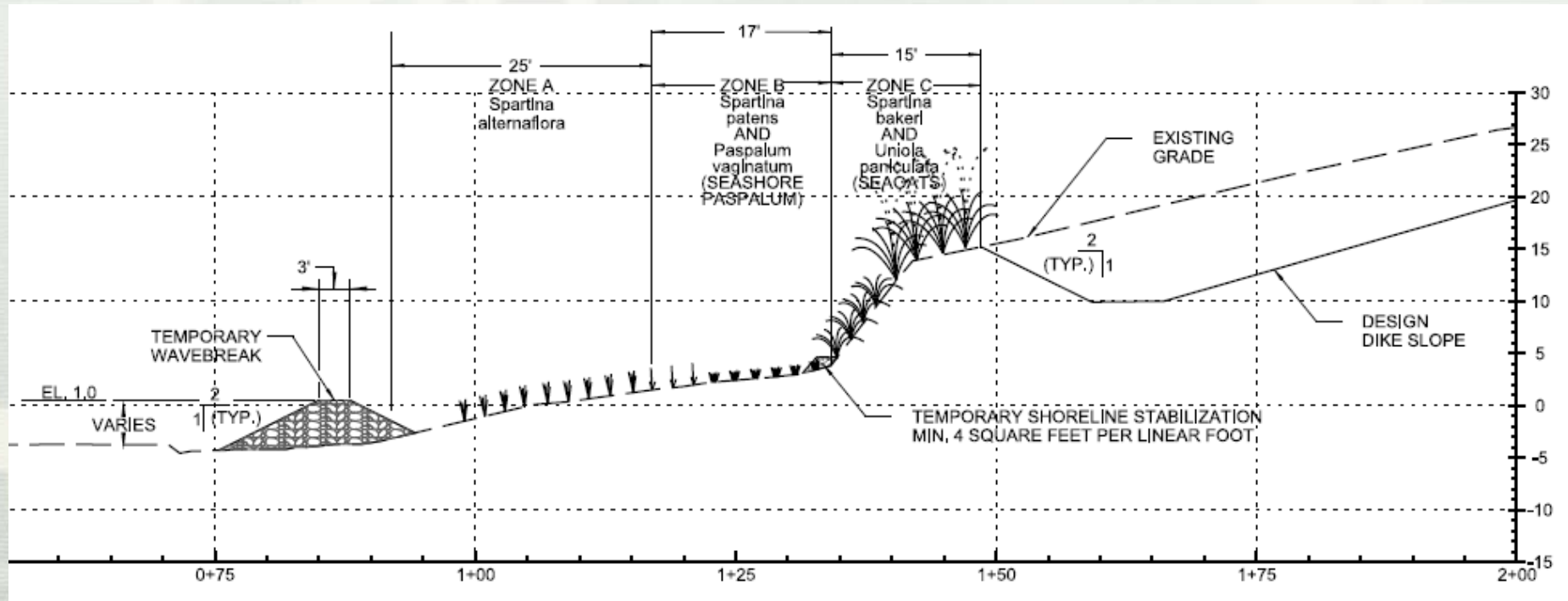


• **Shoreline Planting** for Stabilization and Enhancement



BUCK ISLAND

Shoreline Restoration



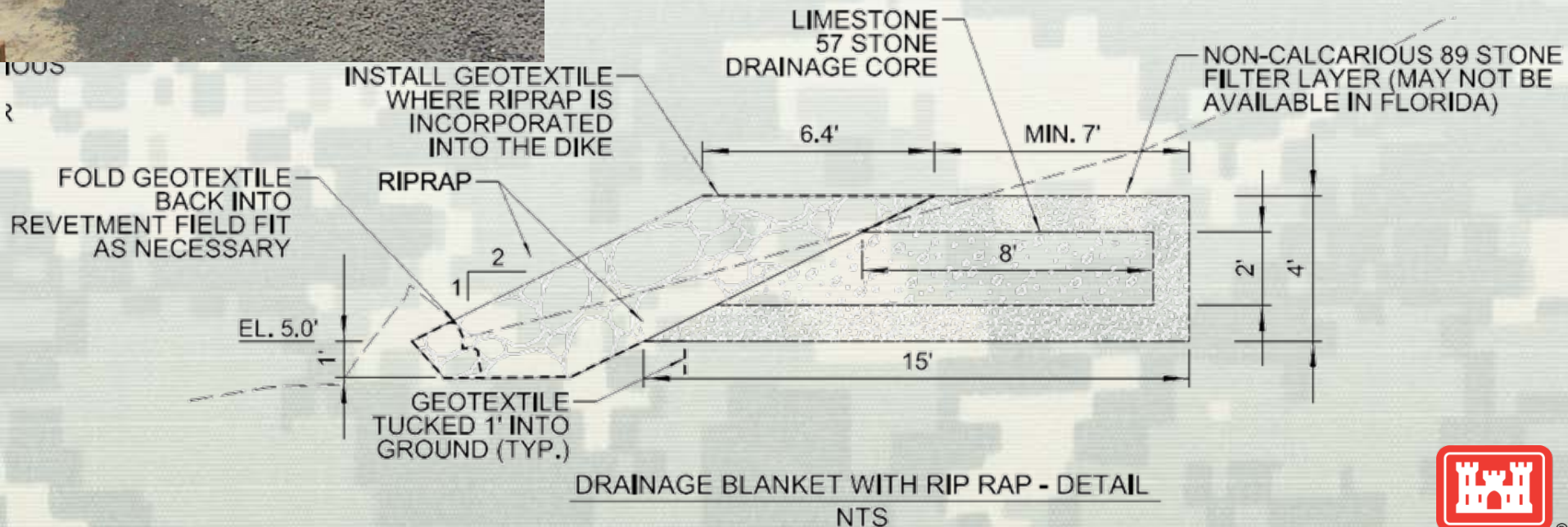
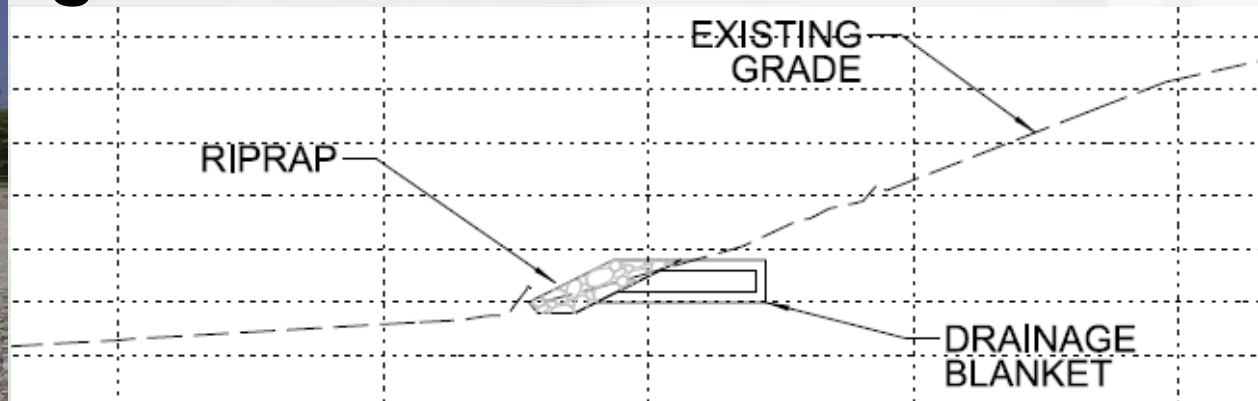
BUCK ISLAND

Shoreline Erosion



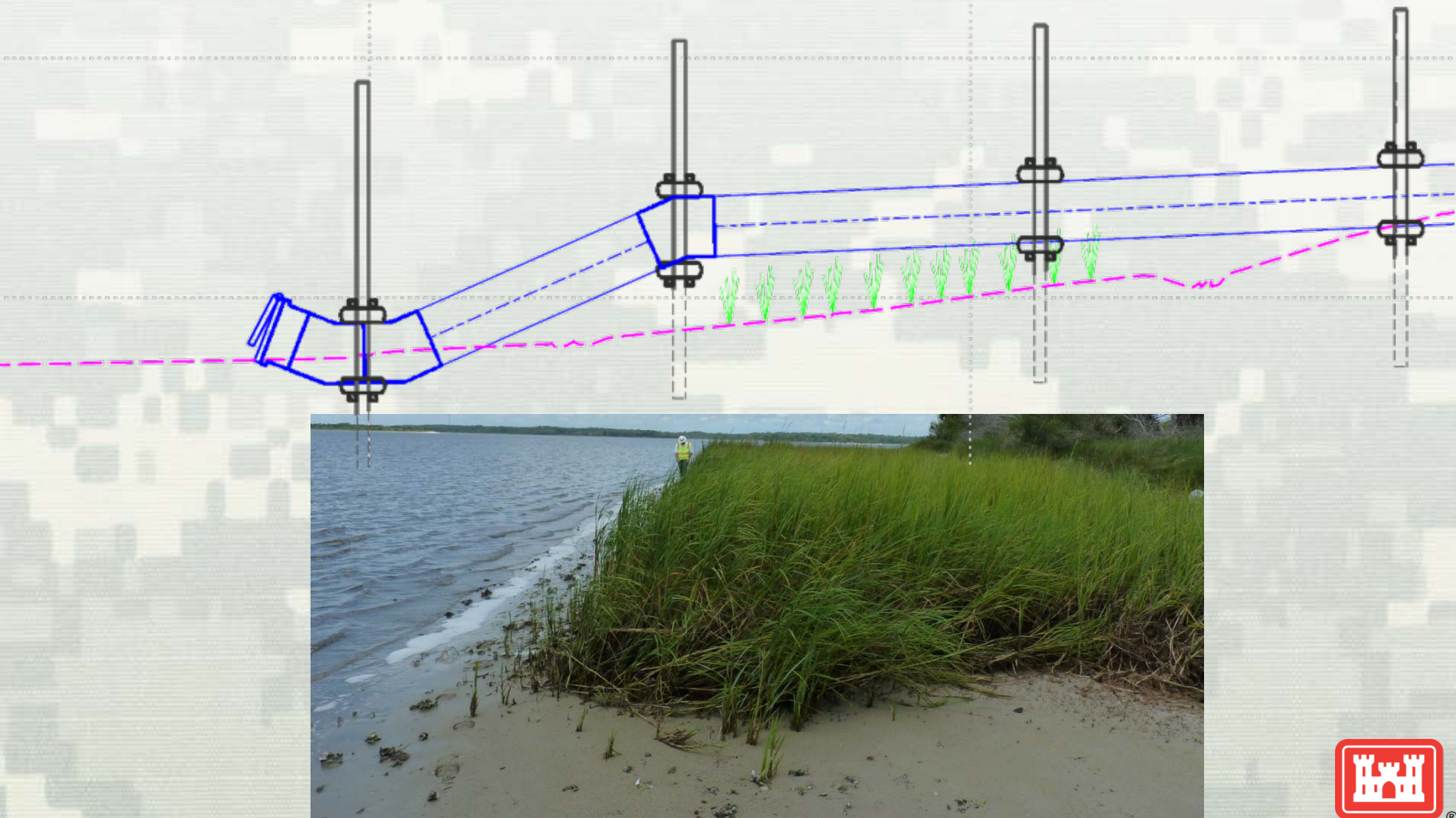
BUCK ISLAND

Shoreline Drainage Blanket



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**

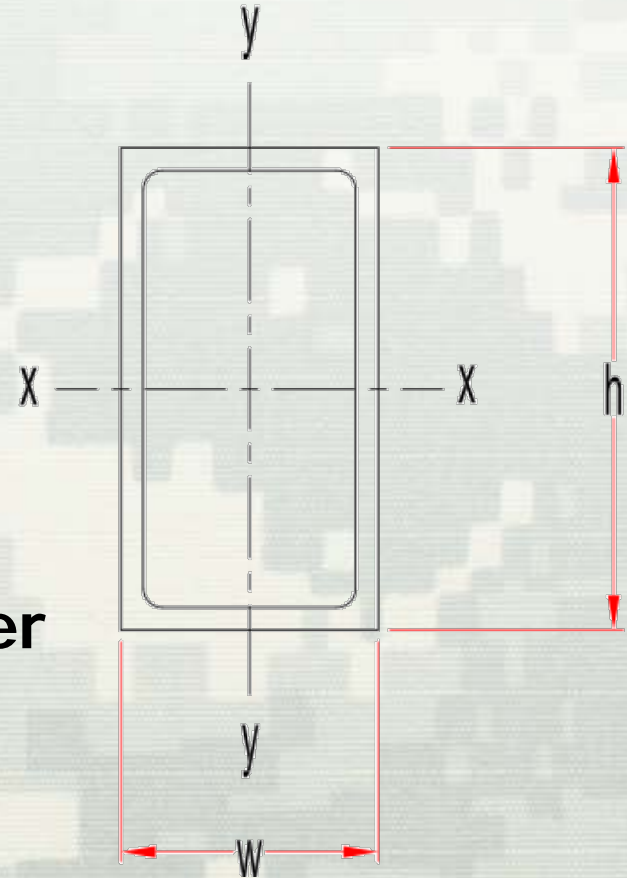


SITE TO REMAIN NAMELESS



COMPOSITE WEIR BOARDS

- 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

