

Session 20

Charles Baxley

Hatch Mott MacDonald

US98 Sheetpile/Gabion Basket Armoring Project

Topic Description

A section of US 98 in Okaloosa County has been totally destroyed multiple times by storm events. The Department is taking a new approach to protect the four-lane section from devastating damage by using sheetpiles and Gabion Baskets. This presentation will provide details on this approach to a huge problem.

Speaker Biography

Mr. Baxley is a native of Chipley, Florida. He is a graduate of the University of Florida in Civil Engineering and is obviously an avid Gator fan. He has 30 years experience in highway design and construction, the last 25 years of which have been with his current employer, Hatch Mott MacDonald (HMM). HMM provided CEI services to FDOT District 3 for the SR 30 (US 98) project from Brooks Bridge to East pass Bridge in Okaloosa County.

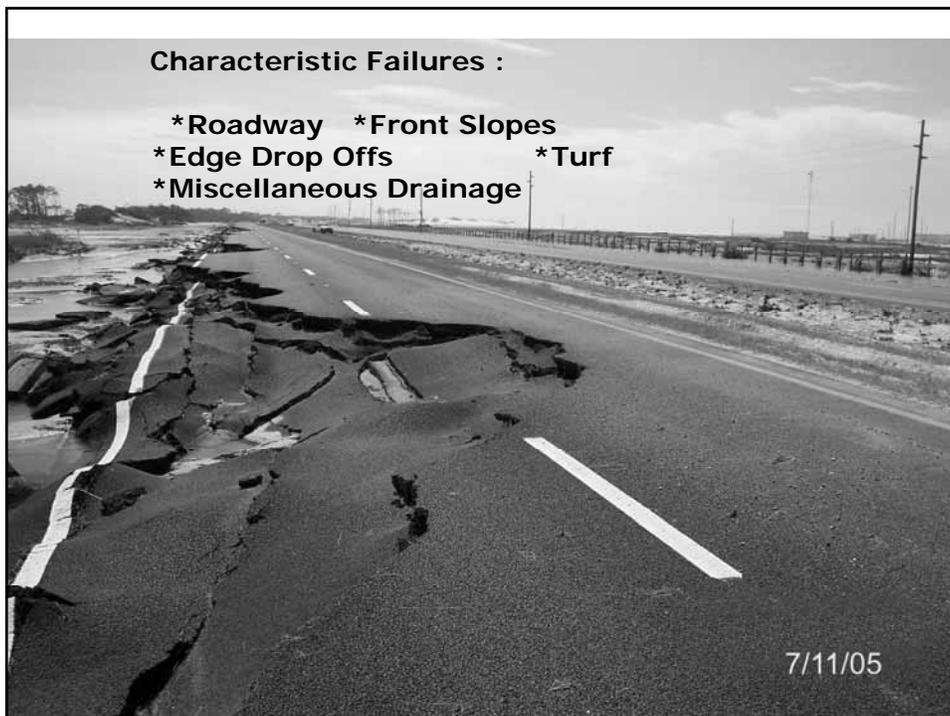
US-98 on Okaloosa Island

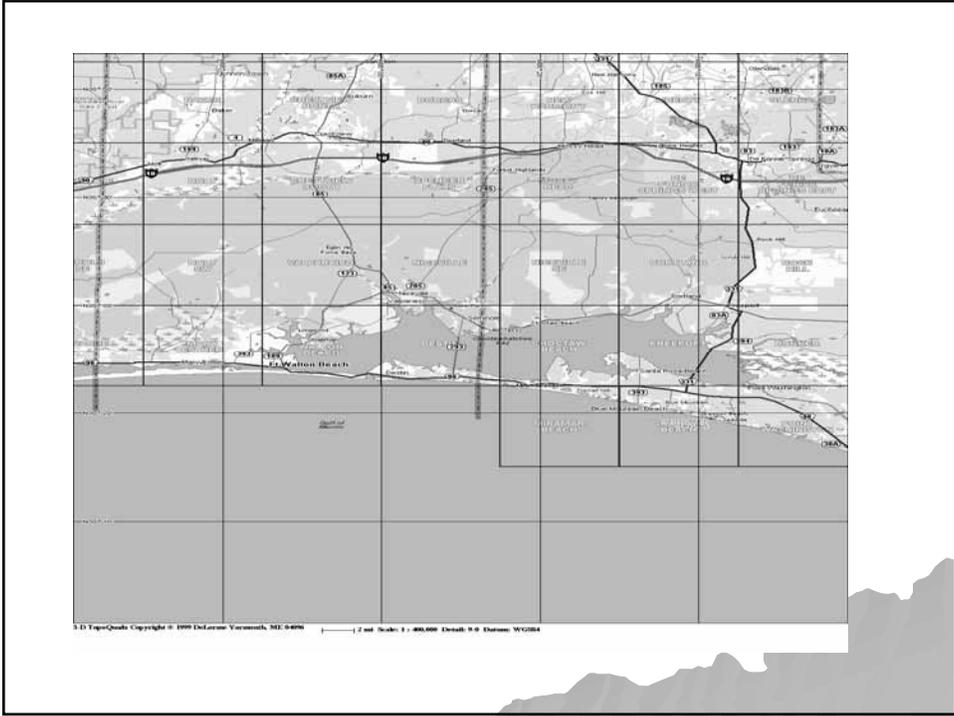
Using Sheet Pile & Gabion Mats for Coastal Roadway Armoring

Presented by Charles Baxley, PE



The focus of this project was to armor and protect US 98 from significant damage effects of hurricane storm surge.





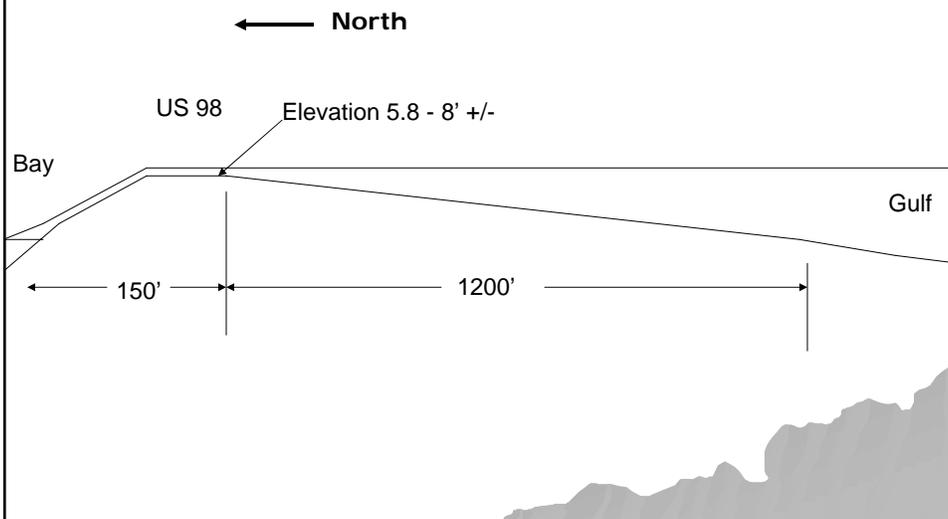
Repair Cost History

Opal (1995)	\$7.4 Million
Ivan (September 2004)	\$5.4 Million
Dennis (July 2005)	\$3.2 Million
Katrina (August 2005)	\$0.2 Million
Total Repairs	\$16.2 Million
Current Project Cost	\$14.3 Million

Failure Modes

- ◆ Roadway overtops from storm surge as Gulf of Mexico enters bay
- ◆ Roadway becomes a spillway or weir
- ◆ Median becomes a sluiceway to lowest elevation point
- ◆ Erosion occurs from North to South

Typical Section Through Okaloosa Island



Tidal Surge



EB Roadway Under Water



Super Critical Flow



North Shoulder Eroding Away



Aftermath – Shoulder Failure



Aftermath – Roadway Failure



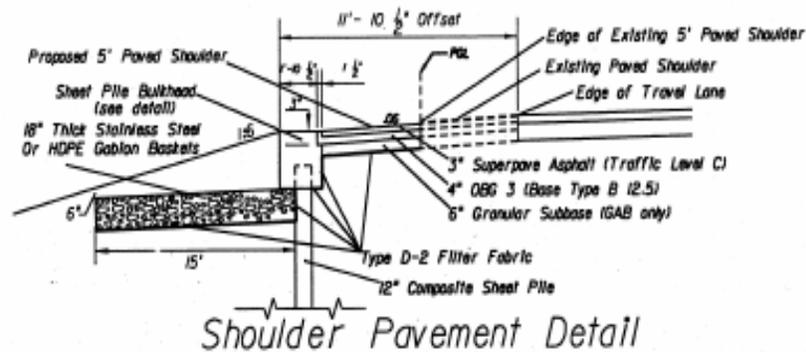
Solution

- ◆ Sheet piling along north side of Roadway
- ◆ Gabion mats underneath shoulders and median
- ◆ Asphalt cap on “high side”

Sheet Piling System

- ◆ Polyurethane Composite Sheet Piling
 - Inexpensive
 - No Corrosion Issues
 - Low structural Strength
 - Installed 18 feet deep
 - Along 2.5 miles of roadway

Sheet Piling Typical Section



Gabion Mats

- ◆ Stainless Steel Corrosion Resistant
- ◆ Self Healing
- ◆ Filter Fabric
- ◆ Hidden until needed

Construction Issues

- ◆ MOT/Lane Closure Restrictions
- ◆ White Sand Ordinance
- ◆ High Public Profile Project
- ◆ Hurricane/Tourist Season Deadline
 - \$1 Million Dollar No Excuse Bonus

Gabion Mat Installation Process

Excavate the Trench



Place Filter Fabric



Place Gabion Baskets



Fill Gabion Baskets with Rock



Open Grate Bucket



Arrange Rock by Hand



Attaching Top Stainless Fabric



Pneumatic Wire Tying Gun



Attaching Top Fabric Continues



And Continues...



Start Backfill Operations



Continue Backfill Operations



Final Appearance



Utility Relocations



Utility Repairs



Sheet Pile Installation



Sheet Piling Mandrel



Unforeseen Buried Asphalt



Aligning Sheet Piles



Finish Driving



Final Sheet Pile Appearance

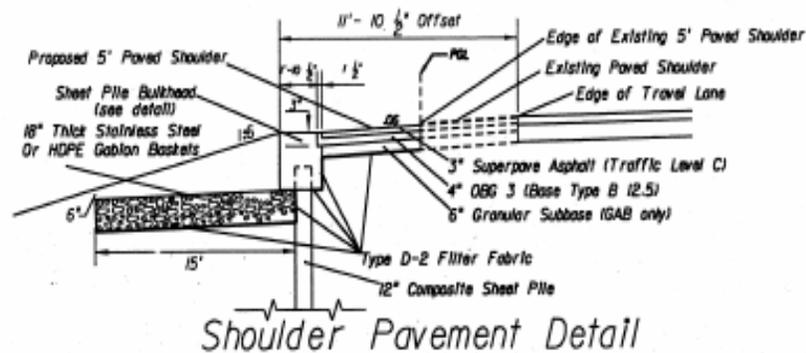


Sheet Pile W/ Gabion Baskets



Concrete Cap Installation

Sheet Piling Typical Section



Tying Cap Rebar



Forming the Cap



Finished Cap



Finished Product



No Questions???

That's Great !!!

THE END