


Soft Soil Challenges


Island Expressway Bridge over Wilmington River Savannah, Georgia



October 31, 2023

Presented by:


Guoming Lin, Ph.D., G.E., D.G.E.
Vice President /Senior Consultant



1

Outline

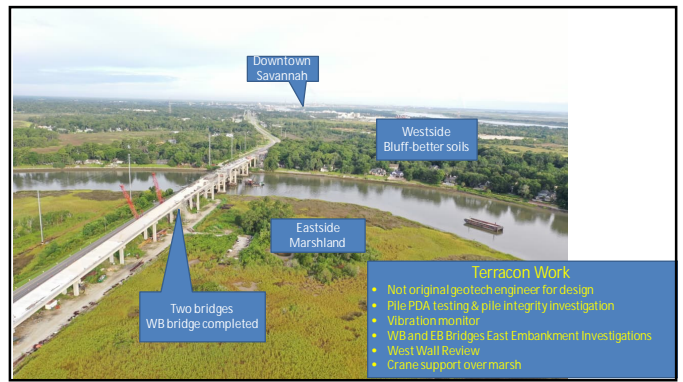
- Location and Layout
- Bridge Foundations
- West Walls (1A)
- East Walls (2A)
- East Embankment & Rigid Inclusions
- Comments and Suggestions



2



3




4



5

Outline

- Location and Layout
- Bridge Foundations
- West Walls (1A)
- East Walls (2A)
- East Embankment & Rigid Inclusions
- Comments and Suggestions



6



7



8



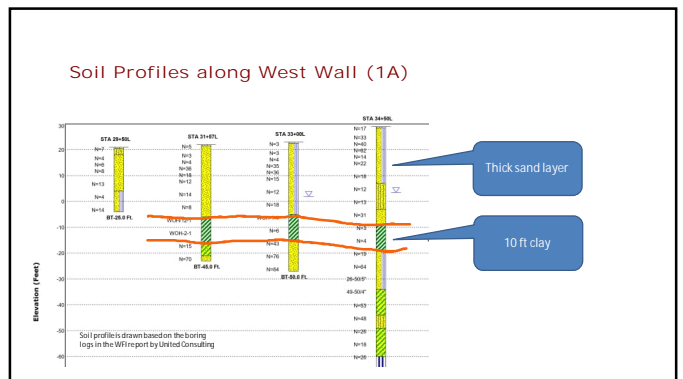
9



10



11



12

Discussions of West Wall

- Three times, three contractors, same wall system.
- Differential settlements between 1A and 1D-rotation to bulge out?
- Sequence, workmanship and compaction?
- Wall 1C was RECO system-built by the third contractor-acceptable.



Outline

- Location and Layout
- Bridge Foundations
- West Walls (1A)
- East Walls (2A)
- East Embankment & Rigid Inclusions
- Comments and Suggestions

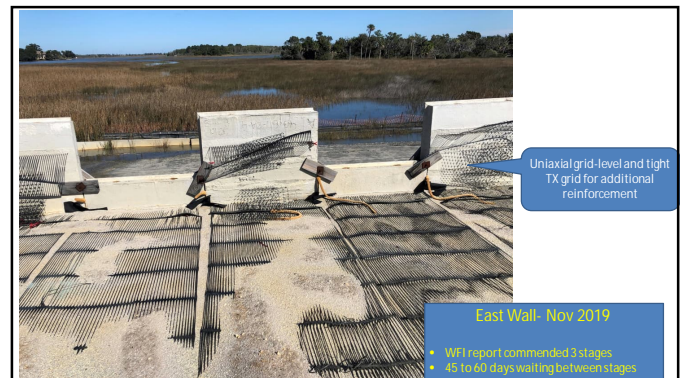


13

14



15



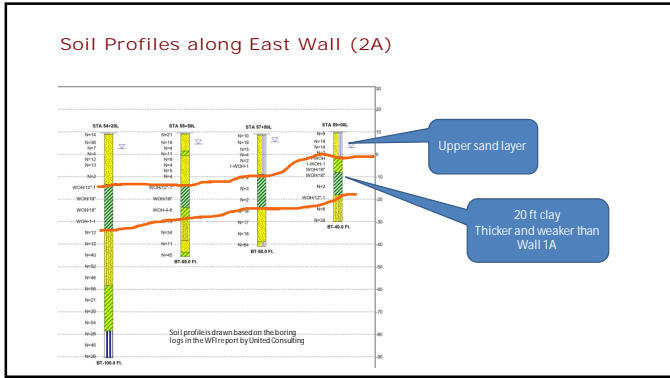
16



17



18



19

Two questions: Staged construction & global stability

- Staged Construction.
- The Geotechnical Report recommended three-stage construction.
- West Wall: took one year to build;
- East Wall: precast panels were on at the beginning. Footings settled >24" at stage 1.
- Attach precast panels to the wired wall can be difficult-especially if the ground settles.

Photo credit: Tensar

20

Global Stability

- The large settlement an indication of global instability?
- Who is responsible for performing global stability analyses? Geotechnical for the WFI? Wall designer?

21



22

Elba Island LNG Containment Dikes D-4

Special measures:

- Controlled rate of fill placement, one lift per week or slower per monitoring data.
- Inclinator to monitor lateral movements to forecast potential sliding.
- Pore pressure sensors to check pore pressure dissipation.


23

Elba Island LNG Containment Dikes D-5

24

Outline

- Location and Layout
- Bridge Foundations
- West Walls (1A)
- East Walls (2A)
- East Embankment & Rigid Inclusions
- Comments and Suggestions



25

East Approach Slab and Embankment (July 2021)

- Max fill=10 ft
- Length=300'
- Settled 5.8" from March to June 2021
- Differential settlements



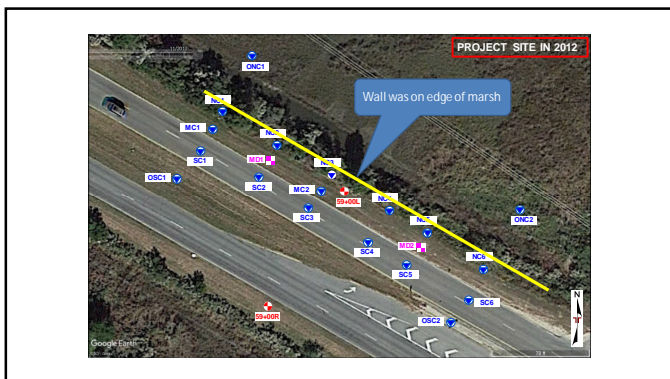

26



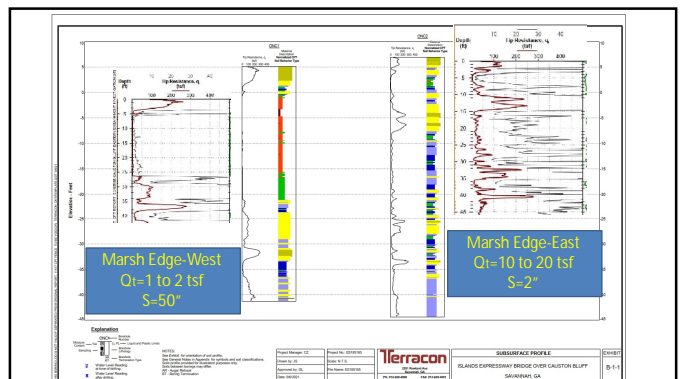
27



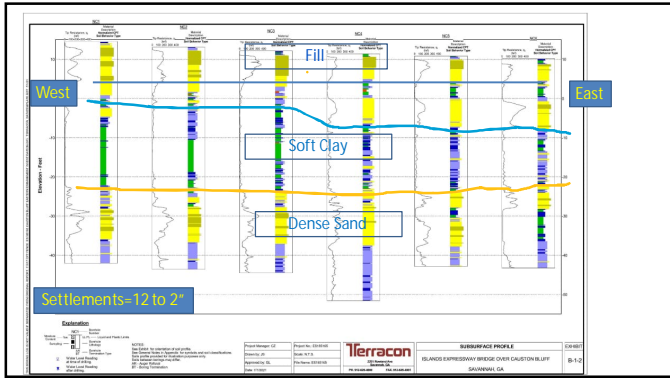
28



29



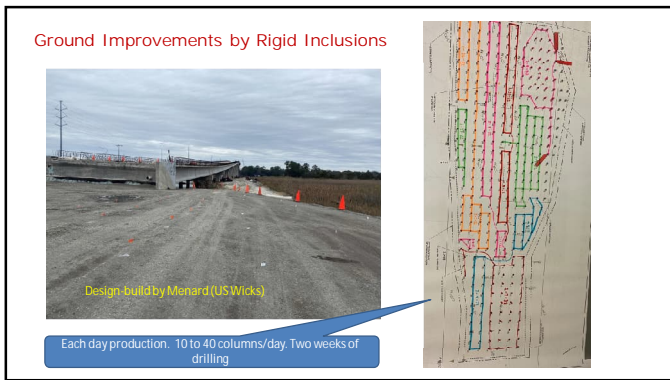
30



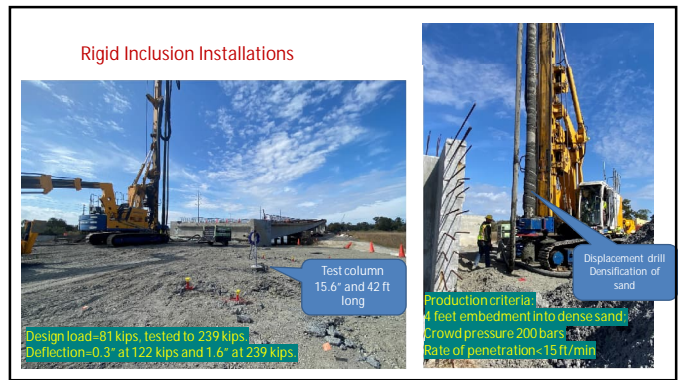
31



32



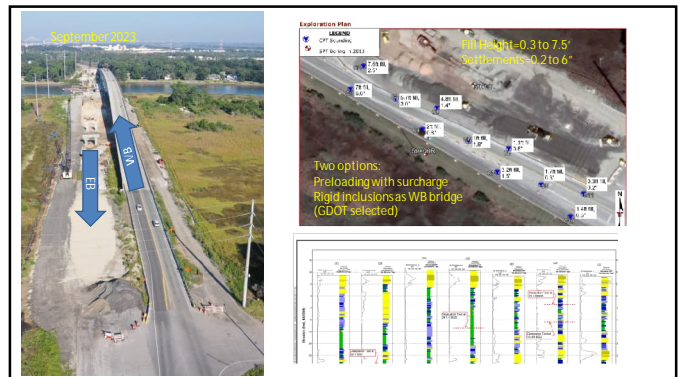
33



34



35



36

