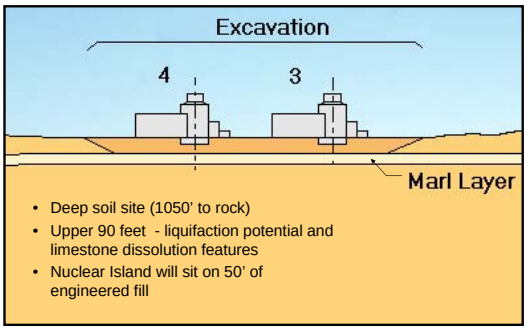
Test Pad Construction for Site with Extensive Backfill

NRC Regulatory Information Conference
March 12, 2008

Tom McCallum
Vogtle Deployment Project Engineer
Southern Nuclear Operating Company

1



- Deep soil site (1050' to rock)
- Upper 90 feet - liquifaction potential and limestone dissolution features
- Nuclear Island will sit on 50' of engineered fill

Vogtle Site Conditions

2

Planned Excavation for Vogtle AP1000

3

Purpose of Test Pad

1. Refine backfill placement techniques
2. Measure backfill properties under field conditions

V_s = Shear Wave Velocity

SASW = Spectral Analysis of Surface Waves

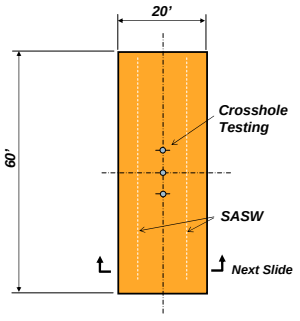
RCTS = Resonant Column Torsional Shear

4

RCTS vs Test Pad

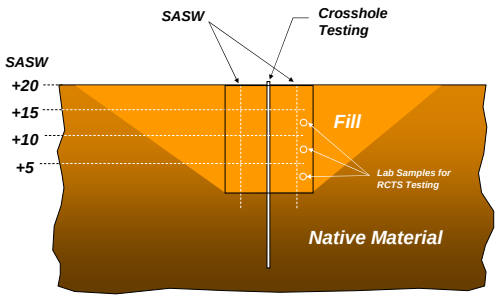
	RCTS	Test Pad
Gradation	Small sample (<1 cu ft)	Large volume (1500 cu yds)
Compaction (Void Ratio)	Compacted using lab equipment	Compacted using field procedures
Confining Pressure	Test apparatus	Overburden
Results	Discrete points	Averaged

5



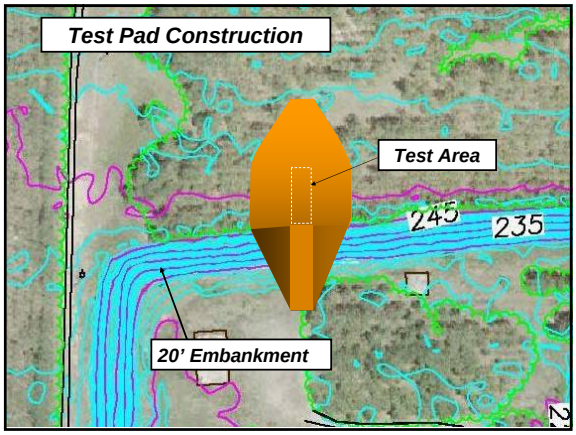
Test Pad Layout

6



Test Pad Elevation View

7



Excavation in Progress

9

Compaction in Progress

10

Moisture Conditioning

11

Surveying after Five Feet of Backfill

12

Density Testing Using Sand Cone Method

13

Hand-Compaction after Sand Cone Test

14

SASW Using Hammer as Source

15

SASW Using Bulldozer as the Source

16

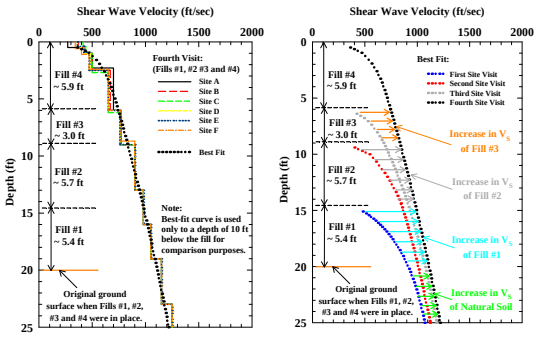
Compaction of Final Layer

17

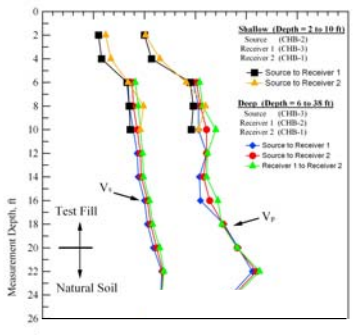
Cross-Hole Testing

18

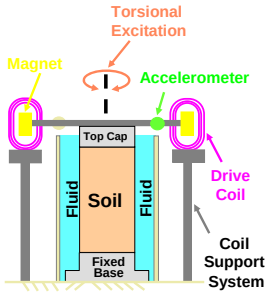
SASW Results



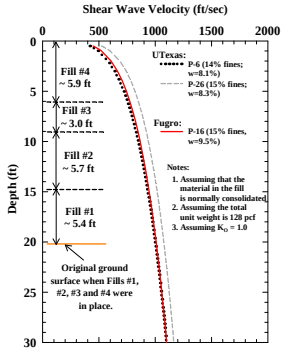
Crosshole Results



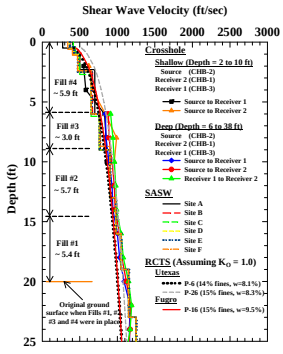
Dynamic Laboratory Tests (RCTS)



Results of Fill Material RCTS Testing



Comparison – Field and Lab V_s Profiles



Summary

- Conclusions:
  - Backfill placement will provide homogeneous fill with predictable properties
  - Backfill V_s will reach 1000 fps at depth of less than 20 feet
  - SASW, cross-hole data were consistent with RCTS predictions of V_s
- Test pad provided confidence that required density and stiffness could be achieved
- Test pad provided insights into variability in backfill properties placed under field conditions