85th Annual TRB Meeting (2006)

Committee on Seismic Design of Bridges

Geoseismic Concerns Subcommittee

AFF50(1)

Tuesday, 24 January, 1:00-3:15 pm
Marriott Hotel, Congressional Room
<table>
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<tr>
<th>Time</th>
<th>Agenda Item</th>
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<tr>
<td>1:00 pm</td>
<td>Opening Remarks</td>
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<tr>
<td>1:10 pm</td>
<td>Self Introductions</td>
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<tr>
<td>1:25 pm</td>
<td>TRB Announcements</td>
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<tr>
<td>1:40 pm</td>
<td>AFF50 Sessions</td>
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<td></td>
<td>#583: Effective Stress Site Response Analysis for Liquefiable Ground (T 7:30)</td>
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<td></td>
<td>#658: Seismic Retrofitting &amp; Current Seismic Research Progress (W 10:15)</td>
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<td>AFF50 Committee Meeting (W 2:30)</td>
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<td>1:45 pm</td>
<td>FHWA Initiatives on Geotechnical Issues</td>
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<td>2:05 pm</td>
<td>Update on NCHRP 12-70: Seismic Design of Retaining Walls, Buried Structures, Slopes, and Embankments</td>
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<tr>
<td>2:25 pm</td>
<td>Discussion of Committee Scope, Research Needs, and Future Sessions</td>
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<td>3:15 pm</td>
<td>Adjourn</td>
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Effective Stress Site Response Analysis for Liquefiable Ground

Session 583, Tue., 7:30-9:30 pm, Empire Room, Shoreham Hotel

T. Leslie Youd, Professor Emeritus, BYU
“Influence of Soil Softening and Liquefaction on Spectral Acceleration”

I.M. Idriss, Professor Emeritus, UC Davis
“Effective Stress Site Response Analysis: Advantages and Limitations”

Geoffrey R. Martin, Professor, USC
“Some Observations on Effective Stress Site Response Analyses using the Program DESRA”

Faiz Makdisi, Principal, Geomatrix Consultants
Lessons From Practice

Panel Discussion
Geoseismic Issues (in Bridge Design)

- Seismic Hazard Analyses
- Site Response
- Liquefaction
  - Occurrence (Triggering)
  - Impacts
- Soil Properties
- Deep and Shallow Foundations
  - Capacity and Stiffness
  - Soil-Structure Interaction
- Retaining Walls (Abutment Walls)
- Approaches
  - Embankments
  - Cuts and Fills
Geoseismic Issues in Bridge Design Research Needs, Future Sessions

Teh Sung, NYS DOT

• Guidelines for Soil-Pile-Structure Interaction Analyses (SPSI)
  – Criteria for Determining Level of Analysis Required / Warranted
  – Appropriate Analysis Methods / Software
  – Evaluation of Geotechnical Parameters

• Lateral Response of Piles in Liquefiable Soils
Geoseismic Issues in Bridge Design Research Needs, Future Sessions

Bill Kramer, IDOT

• Return Period for ULE (IDOT endorses 1000 yr RP)

• Dynamic Stiffness of Layered Soil Profiles
  – Impact of Thin (< 2.5 ft) Liquefiable Layers

• Evolution of Dynamic Forces and Pore Pressures
  – If peak dynamic force is early and liquefaction is late, do we need to analyze for both?
Geoseismic Issues in Bridge Design Research Needs, Future Sessions

Tom Cooling, URS

• Lateral Spreading Forces on Large (100 ft) Caissons
  – w/ and w/o liquefiable crust

• Tolerable Lateral Movements for Foundations Subject to Dynamic Loads
  – Is AASHTO 1.5” limit appropriate, and does it apply to static plus seismic movement?

• Seismic Design of Auger Cast Piles
  – Ductility and Survivability
  – Detailing of Pile Head and Pile Cap Connection
Geoseismic Issues in Bridge Design
Research Needs, Future Sessions

Lee Marsh, ABAM

• Improved and Simplified Techniques to Integrate Structural and Geotechnical Phenomenon

• Rational Methods to Combine Vibrational (Shaking) Response and Ground Deformation (e.g. Lateral Spreading)
Geoseismic Issues in Bridge Design Research Needs, Future Sessions

Ed Kavazanjian, ASU

• Evaluating Residual Shear Strength
• Predicting the Impacts of Liquefaction
  – Lateral Spreading
  – Forces on Piles
  – Settlement
  – Site Response / Dynamic Forces
• Performance of Mitigation Measures
  • Stone Columns
  • Vertical Drains
  • Reinforced Soil Mats
Geoseismic Issues in Bridge Design
Research Needs, Future Sessions

Other Issues / Topics
• ???
Geoseismic Issues in Bridge Design
Research Needs, Future Sessions

Prioritized

1. Performance of Foundations Subject to Seismic and Other Extreme Loads (Research statement with AFS30, maybe AFS40)
   1. Large Diameter Caissons Subject to Liquefaction
   2. Performance-Based Design Criteria

2. Evaluation of Residual Shear Strength (Joint session with AFS30, maybe AFP30)

3. Performance of Piles in Liquefied Soil (Synthesis Report)

4. Evaluation of Soil Properties for Seismic Analysis
   1. Recommendations for Lab and Field Testing
   2. LRFD Calibration

5. Seismic Analysis and Design of Shallow Foundations
   1. Methods of Analysis
   2. Soil Properties
   3. LRFD