

# Introduction to Nonlinear Effective-Stress Site Response Analysis

Portland, Oregon – October 20, 2007  
Schedule

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<b>Registration – Continental Breakfast</b>	<b>8:00 – 8:30</b>
<b>1. Introductions and Objective</b>	<b>8:30 - 9:00</b>
<ul style="list-style-type: none"><li>• Registration</li><li>• Personnel Introduction (Dr. Neven Matasovic and Gustavo Ordonez)</li><li>• Course Participant Introductions</li><li>• Philosophy – Objectives – Limitations</li></ul>	
<b>2. Role of Advanced Analyses in Geotechnical Earthquake Engineering</b>	<b>9:00 - 10:00 (Neven)</b>
<ul style="list-style-type: none"><li>• Why and When is Nonlinear Analysis Needed?</li><li>• Why and When is Effective Stress Analysis Needed?</li><li>• When to use the Nonlinear and Effective-Stress Analyses?</li><li>• When are 2-D and 3-D Analyses Required?</li><li>• When Soil-Structure Interaction Effects Should not be Ignored?</li><li>• Limitations of Site Response Analyses</li></ul>	
<b>Break</b>	<b>10:00 - 10:15</b>
<b>3. Nonlinear and Effective-Stress Analyses</b>	<b>10:15 - 12:00 (Neven)</b>
<ul style="list-style-type: none"><li>• Theoretical Background</li><li>• Modeling<ul style="list-style-type: none"><li>○ Layer Thickness, Transmitting versus Rigid Boundary</li><li>○ Evaluation of Rayleigh (Viscous Damping) Parameters</li><li>○ Porewater Pressure and Cyclic Degradation of Clay Models</li><li>○ Use of Generic Input Parameters</li><li>○ Generation of Input Parameters from Published Data</li></ul></li><li>• Interpretation of the Results<ul style="list-style-type: none"><li>○ Calculation of Soil Liquefaction</li><li>○ Calculation of Seismically-Induced Settlement</li><li>○ Quasi 2-D Effects and Slip Elements</li></ul></li><li>• Validation of D-MOD2000<ul style="list-style-type: none"><li>○ Response to Sinusoidal Loading and Handling of Reversals</li><li>○ Case Histories</li><li>○ Comparison with Other Programs</li></ul></li></ul>	
<b>Lunch</b>	<b>12:00 - 1:00</b>
<b>Nonlinear and Effective-Stress Analyses (cont.)</b>	<b>1:00 - 1:30 (Neven)</b>
<ul style="list-style-type: none"><li>• Validation of D-MOD2000<ul style="list-style-type: none"><li>○ Response to Sinusoidal Loading and Handling of Reversals</li></ul></li></ul>	

- Case Histories
- Comparison with Other Programs
- D-MOD Options and Models

**4. Nonlinear Analysis - D-MOD2000 Hands-on Training** **1:30 - 3:00 (Gus)**

- Program Download and Installation
- Site Specific Response Analysis with D-MOD2000
  - Problem Definition
  - Selection of Input Ground Motions
  - Dynamic Soil Properties
  - Soil Column
  - Assignment of Input Motion

**Break** **3:00 - 3:15**

**5. Nonlinear Analysis - D-MOD2000 Hands-on Training (cont.)** **3:15 - 4:30 (Gus)**

- Site Specific Response Analysis with D-MOD2000
  - Acceleration & Shear Stress Time Histories
  - Porewater Pressure and Degradation Index Time Histories
  - Response Spectrum
- Processing of Output Data from D-MOD2000

**Closure** **4:30 - 5:00**

- Questions/Answers