NONDESTRUCTIVE EVALUATION (NDE) AND GEOPHYSICS USERS SEMINAR COURSE OUTLINE

March 10 - March 12, 2020 8:30 am - 5:00 pm
Rockville, Maryland

In addition to NDE and geophysical method presentations, questions/discussion sessions and hands-on demonstrations will be conducted for most test methods with an instructor’s guidance. A total of 7.5 PDH certificate hours will be awarded each day for use in Professional Engineering registration continuing education requirements. Classes start at 8:30 am and end at 5:00 pm with lunch provided by Olson. Coffee, drinks, and snacks provided daily.

Seminar Costs - $350/day

Register by: emailing Seminars@OlsonInstruments.com, or online at www.OlsonInstruments.com/Support/Training, and select the “NDE Users Seminar” link on the page. PayPal payments only if registering online.

Class size is limited to 30 participants, register early!

Contact our office if you would like assistance. Ex: letter of invitation for a US visa, lodging, etc.

Day 1, March 10 (Tuesday)

Structural NDE Methods for Concrete, Masonry & Wood
Concrete Condition Assessment & Quality Assurance

» Basic NDE Physics Overview
  Wave Types
  Wave Propagation
  Wave Speeds
  Reflection and Transmission

» Ultrasonic/Sonic Pulse Velocity and Velocity Tomography for Quality and Integrity on Concrete with 2-Sided Access
  Test Procedures and Equipment
  Pulse Velocity Physics and ASTM C597
  Materials and Case Histories
  Strength Correlations
  Velocity Tomography

» Impact Echo for Thickness and Integrity on Concrete with 1-Sided Access
  Test Procedures and Equipment
  Impact Echo Physics and ASTM C1383
  Thickness Q/A of Pavements
  Materials and Case Histories for Void, Honeycomb, Cracking
  Impact Echo Scanning
Day 1, March 10 (Tuesday) ...continued

Structural NDE Methods for Concrete, Masonry & Wood
Concrete Condition Assessment & Quality Assurance

» Spectral Analysis of Surface Waves for Concrete with 1-Sided Access
  Test Procedures and Equipment
  SASW Physics
  SASW for Concrete Quality/Strength Correlation
  Damage Evaluation of Cracking, Fire, Frost, Alkali-Silica Reaction

» Galvanostatic Pulse, Concrete Resistance and Half-Cell Potential for Rebar Corrosion
  Test Procedures and Equipment
  Corrosion Measurement Physics
  Case Histories

» Ground Penetrating Radar on Concrete and Pavements
  Test Procedures and Equipment
  Structural Embedment Location
  2D and 3D Data Analyses
  Bridge Deck Surveys for Delaminations
  Void/Wet Subgrade Detection for Pavements and Slabs
  Roadway/Pavement Thickness Evaluation

» Slab Impulse Response for Structural Evaluation and Void Detection below Rigid Pavements
  Test Procedures and Equipment
  Physics and ACI 228.2R and ASTM C1740
  Structural Condition Assessment
  Subgrade Void vs. Questionable vs. Sound Support
  Correlations with Ground Penetrating Radar for Void Detection
  Structural Case History

» Resonance Testing of Cylinders, Beams and Cores for Freeze-Thaw Durability and Elastic Moduli
  Test Procedures and Equipment per ASTM C215-08 for Elastic Moduli
  Calculation of Young’s and Shear Moduli, and Poisson’s Ratio
  ASTM C666/666M-03 (2008) applications for Freeze-Thaw Durability

» Bridge Monitoring and Load Tests
  Test Procedures and Equipment
  Traditional Monitoring and Testing Methods
  Interferometric Phase Radar for Bridge Displacements and Vibration

» Bridge Deck Scanning
  Test Procedures and Equipment
  IE Scanning of Bridge Decks and Slabs
  SASW Scanning of Bridge Decks and Slabs
  Data Analysis and Presentation
Day 2, March 11 (Wednesday)

Quality Assurance & Forensic NDE Methods for Pavements & Foundations

» Lightweight Deflectometer for Subgrade and Base Compaction Control
  - Test Procedures and Equipment
  - Data Analysis
  - Materials and Case Histories
  - Proctor Test for Field Implementation
  - Discussion of University of Maryland Pooled Fund Study for LWD Testing Protocol

» Crosshole Sonic Logging for QA of Drilled Shaft Foundations, Auger Cast Piles and Diaphragm Walls
  - Test Procedures and Equipment
  - Review of ASTM D6760-08 and European Standard
  - CSL Ultrasonic Signal Analysis and Anomaly/Debonding Considerations
  - Log Generation and Report Considerations
  - Velocity vs. Strength
  - Angled and Singlehole Sonic Logs
  - Research and Case History Results
  - When does an anomaly become a defect?
  - Destructive Coring/Drilling Considerations
  - General Repair Approaches

» Crosshole Tomography for 2-D and 3-D Imaging of CSL Anomalies
  - Review of Tomography Algorithms
  - Data Collection Procedures in CSL tests for Velocity Tomography
  - Data Analysis of Angled CSL data
  - Velocity Tomography Analyses
  - 2-D vs. 3-D Velocity Tomograms in Research and Case Histories

» Sonic Echo/Impulse Response for Shaft/Pile Integrity and Length in QA and Forensic Studies
  - Test Procedures and Equipment
  - Review of ASTM D5882-07 and ACI 228.2R-98
  - Sonic Echo Physics
  - Impulse Response Physics
  - Research and Case History Results for Concrete, Wood and Steel Piles
  - Testing through Pilecaps and on Pile Sides

» Parallel Seismic for Shallow and Deep Foundation Unknown Depth Determinations and Buried Piles below Pilecaps
  - Test Procedures and Equipment
  - Review of ACI 228.2R-98
  - Parallel Seismic Physics
  - Research and Case History Results for Concrete, Wood, and Steel Piles and Masonry Piers/Abutments and Steel H-Pile and Sheet Pile Considerations
  - Unknown Foundation Depth Determinations for Bridge Scour Safety Studies

» Ground Penetrating Radar for Unknown Foundation Depths/Pile Locations
  - Test Procedures and Equipment
  - Review of ACI 228.2R-98
  - Research and Case History Results
Day 2, March 11 (Wednesday) ...continued

Quality Assurance & Forensic NDE Methods for Pavements & Foundations

» Impact Echo for 1-Sided Concrete Thickness and Integrity of Piers, Abutments, and Pilecaps
  Test Procedures and Equipment
  Impact Echo Physics and ASTM C1383
  Unknown Thickness Determinations

» Dam Condition Evaluation
  Test Procedures and Equipment
  Cross-Dam Tomography
  SASW and IE Applied to Dams
  Interferometric Phase Radar (IBIS-L) for Dams and Slopes

» Asphalt/Concrete Pavement Evaluation with Impact Echo/Spectral Analysis of Surface Waves Scanning
  Test Procedures and Equipment
  Detection of Delamination and Ravelling
  Surface Waves for Elastic Modulii Determination
Day 3, March 12 (Thursday)

Applied, Engineering and Environmental Near-Surface Geophysics

» Introduction
  - Geophysics versus NDE
  - Applications
  - Instrumentation
  - Resolution
  - ASTM Standard D6429 and Guidelines
  - Matrix of Methods and Applications

» Seismic Methods
  - Refraction Method
  - Reflection Method
  - Multichannel Analysis of Surface Waves (MASW) both active and passive
  - Borehole Methods: In-hole, Downhole and Crosshole

» Ground Penetrating Radar (GPR)

» Electrical Resistivity

» Electromagnetic Methods
  - Metal Detectors
  - Electrical Conductivity Profiling
  - Deep Conductivity Methods
  - Nuclear Magnetic Resonance

» Potential Fields
  - Magnetic Method
  - Gravity
  - SP

» Wrap-up Geophysical Survey Methods

For each method we will cover the theory, instrumentation, maximum depth of penetration, resolution, data collection methods, data processing methods, analysis, interpretation, and reporting. We will also cover some case studies for each method.

We will have hands on demonstrations both inside and outside for seismic refraction tomography (SRT), multichannel analysis of surface waves (MASW), electrical resistivity, spontaneous potential (SP), and total field magnetics.

Seminar Location:
Olson DC Office
7529 Standish Place Rm 360
Rockville, MD 20855
Hours: 8:30 am — 5:00 pm
p: 303.423.1212    f: 303.423.6071

Registration is available either by phone, email, or online at:
Contact us at 303.423.1212 or email: Seminars@OlsonInstruments.com