

**COURSE NUMBER**

FHWA-NHI-132094A

COURSE TITLE**LRFD Seismic Analysis and Design of Transportation Geotechnical Features**

The Instructor-Led 132094A Course has a prerequisite Web-Based Training (WBT), NHI-132010A Earthquake Engineering Fundamentals, that participants must complete before the start of the 132094A course. The WBT prerequisite course consists of 6 lessons including: Earthquake Fundamentals (L1); Intro to LRFD Seismic Design (L2); Earthquake Ground Motions (L3); Seismic Hazard Analysis (L4); AASHTO Design Ground Motion Characterization (L5); and Intro to Geotechnical Hazards (L6).

This 2-day NHI training course 132094A entitled “LRFD Seismic Analysis and Design of Transportation Geotechnical Features” is a shortened version of the NHI training course 132094 “LRFD Seismic Design of Transportation Geotechnical Features and Structural Foundations” focusing specifically on the geotechnical earthquake engineering aspects. It is a comprehensive and practical training course that addresses seismic analysis and design of transportation geotechnical features including ground motion characterization, development of the AASHTO acceleration response spectrum for structural design using the 1000-yr USGS hazard map for reference site conditions, and evaluation of AASHTO site class and application of AASHTO soil factors to account for local soil conditions; site characterization for geotechnical seismic analysis; equivalent linear site response analysis; identification of geotechnical seismic hazards; seismic stability and deformation analysis of embankments and slopes; analysis procedures for liquefaction and liquefaction-induced lateral spread or flow failures; seismic settlement analysis; and geotechnical hazard mitigation measures. The 132094A course also focuses on interactions between the geotechnical specialist and the bridge design engineer in the seismic design process.

OUTCOMES

Upon completion of the course, participants will be able to:

- Describe the AASHTO seismic design performance criteria and develop an AASHTO acceleration response spectra for reference site (weak rock) conditions.
- Calculate fundamental period of the site and peak ground velocity from a spectral acceleration.
- Identify key soil properties necessary for seismic analysis and methods for evaluating them.
- Identify conditions warranting, establish input parameters, and conduct a one-dimensional equivalent linear site response analysis.
- Assess seismic slope stability and deformation potential in accordance with the AASHTO specifications and national state of art analysis and design guidance.
- Evaluate the potential for earthquake-induced liquefaction and its impacts on geotechnical transportation features in accordance with AASHTO specifications and national state-of-practice analysis and design guidance.
- Identify common mitigation methods for geotechnical seismic hazards.

TARGET AUDIENCE

This course is intended to engage a target audience of bridge and geotechnical engineers with zero and up to 20 years of experience, through instructor-led presentations, discussions, Q&A, group activities, walkthrough examples, and hands-on student exercises. At the end of design lessons, participants will have the opportunity to undertake a group design exercise to reinforce learning and enhance the transfer of new skills and knowledge to the workplace.

TRAINING LEVEL: Intermediate

FEE: 2016: \$775 Per Person; 2017: \$775 Per Person

LENGTH: 2 DAYS (CEU: 1.4 UNITS)

CLASS SIZE: MINIMUM: 20; MAXIMUM: 30

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