

**COURSE NUMBER**

FHWA-NHI-132082

**COURSE TITLE****LRFD for Highway Bridge Substructures**

This course expands the suite of FHWA services to assist State and local governments in the successful implementation of load and resistance factor design (LRFD). The course promotes the philosophy of the LRFD design platform, establishes the motivation for LRFD as a reassurance that safe design practices are being applied, and applies these principles to geotechnical design for bridge foundations. The course's PowerPoint slides and Participant Workbook are regularly updated and the course follows the latest American Association of State Highway Transportation Officials (AASHTO) "LRFD Bridge Design Specifications".

Major topics in this course include: loads, load distribution, and load combinations; principles of limit state designs; geotechnical spread footing design (soil and rock); driven pile and drilled shaft design (soil and rock); and substructure design and detailing for a cantilever abutment and hammerhead pier.

Structured as a combination of Instructor-led discussions and workshop exercises, this course includes LRFD theory applied to design examples and illustrates step-by-step LRFD design procedures. The training includes the extensive use of student exercises and example problems to demonstrate overall design, detailing, and construction principles addressed in the reference materials. The course also provides hands-on experience in the AASHTO LRFD design and detailing of bridge abutment and pier elements, deep and shallow foundation design, and earth retaining structures. Exercise and example problems are based on components of overall comprehensive bridge design examples using AASHTO LRFD and provide comparisons between ASD, LFD, and LRFD design methods.

**OUTCOMES**

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

- Define AASHTO LRFD limit states and compute structural and geotechnical design loads
- Apply AASHTO LRFD criteria for design
- Integrate the AASHTO LRFD specification provisions into the host agency's current practice
- Integrate the geotechnical aspects of LRFD foundation design into LRFD structural design

**TARGET AUDIENCE**

Bridge, geotechnical, and transportation engineers with 0-20 years of experience who are responsible for the design and construction of bridge substructures on surface transportation facilities may benefit from this course.

**TRAINING LEVEL:** Intermediate

**FEE:** 2013: \$900 Per Person; 2014: N/A

**LENGTH:** 4 DAYS (CEU: 2.4 UNITS)

**CLASS SIZE:** MINIMUM: 20; MAXIMUM: 40

**NHI Customer Service:** (877) 558-6873 • [nhicustomerservice@dot.gov](mailto:nhicustomerservice@dot.gov)