

# ***Earth-Retaining Structures: Selection, Design, Construction, and Monitoring/Inspection***

## **Purpose and Background**

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The United States earth retaining structure market exceeds 225 million square feet annually (temporary and permanent) and there are over 50 different retaining systems to select from which are unique in design and construction. Unit costs vary from approximately \$30 to in excess of \$1250 per square foot. Selecting the most technically appropriate and cost-effective system is often critical to project cost and schedule. Selection of an inappropriate system unfortunately can result in time consuming and costly construction disputes and scheduling delays. Many engineers, contractors and project managers do not have the needed knowledge and skills to select, design and construct these systems.

The instructor presents the critical knowledge and skills you need in order to take advantage of the cost effective use of earth retaining structures in urban construction for transportation, commercial and industrial development. From start to finish - from design to construction and general site development -the instructor will lead you through the myriad of more than 50 different retaining wall systems from which you can choose.

During this two-day program the instructor presents a logical sequence of topics and activities to allow participants to demonstrate their knowledge and skills. These activities include: lecture, student exercises, instructor lead example problems and lively discussion periods. All participants will receive a copy of the newly released publication from the Federal Highway Administration (June 2008) on the selection, design and construction of Earth Retaining Structures. This publication is the third edition of the subject document, has been totally rewritten with expanded and updated sections in many topics including subsurface drainage, selection of soil and rock parameters and detailed design examples.

The course publication closely follows the current AASHTO specifications for Bridges and Structures but has direct standard of practice guidance for all Civil Engineering applications which require temporary and permanent retaining structures.

For group training, contact John Wyrick ([JWyrick@asce.org](mailto:JWyrick@asce.org))  
or Stephanie Tomlinson ([STomlinson@asce.org](mailto:STomlinson@asce.org))

## Summary Outline

### DAY ONE

- Introductions, Learning Objectives and Course Overview
- History/Classification/Selection of Earth Retaining Systems
- Soil and Rock Parameters (tests and soil and rock parameter selection)
- Lateral Earth Pressures
- Cast-in-Place and Semi-Gravity Walls
- Modular Gravity Walls
- Mechanically Stabilized Earth Walls

### DAY TWO

- MSE Walls Design and Construction
- Externally Stabilized Walls (e.g., Sheet Pile, Soldier Pile and Lagging, Slurry Walls) Intro
- Externally Stabilized Wall Design
- Ground Anchor Walls
- Soil Nail Walls and Micropile Walls
- Course Summary and Closure

## Seminar Benefits

- Recognize potential applications for earth retention structures used in civil engineering applications
- Select the most technically appropriate and cost-effective earth retaining system for your application
- Examine and select appropriate material properties, soil/rock design and construction parameters and earth pressure diagrams
- Prepare conceptual and basic designs using appropriate design methods, factors of safety, earth pressure diagrams and field verification methods
- Evaluate and review contractor submitted designs and construction installation plans
- Select appropriate specification/contracting method(s) and prepare contract documents
- Demonstrate a clear understanding of retaining wall construction, inspection and preservation

## Seminar Instructor

**Jerry A. DiMaggio, P.E., M.ASCE, D.GE**, is a principal civil engineer at Applied Research Associates, Inc. Mr. DiMaggio specializes in the design and construction of geotechnical features and served the civil engineering and construction communities related to strategic planning, innovation deployment, risk management and the development of business plans. He is internationally recognized for his technical accomplishments and contributions on the design, construction, evaluation, forensic assessment and disputes resolution of structural foundations, earth retaining structures, ground improvement techniques and engineered earthworks. Mr. DiMaggio has served on a number of projects related to limit state design (LRFD), risk management assessment and management, innovative contracting and accelerated construction. He is the retired Principal Bridge Engineer, and Geotechnical Engineering National Program Manager with the U.S. DOT, FHWA in Washington D.C. and was previously the Implementation Manager of the internationally recognized SHRP2 program at the National Academies in Washington D.C. He has presented over 400 short courses and provided consulting services on approximately 1000 projects in all 50 states, Central and South America and the Middle East. Jerry has received numerous career recognitions including FHWA's Engineer of the Year and Administrator's Awards, awards from TRB, PDCA, ADSC and ASCE's Kapp and Opal Awards.

He has been a member of the adjunct faculty at the University of Delaware, Johns Hopkins University, the University of Akron and Columbia University and an invited Keynote speaker at over 35 national meetings and conferences. Mr. DiMaggio has authored numerous technical papers and edited three civil engineering books.

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