

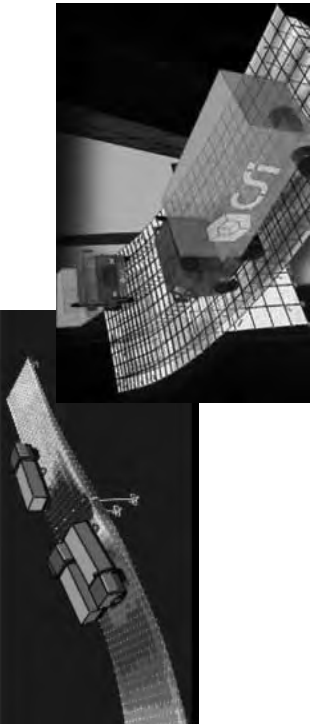
Local Technical Assistance Program

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**Michigan's
Local Technical
Assistance Program**



**June 24-25, 2008
June 26-27, 2008**

2 Sessions:

Analysis Refined Structural Finite Element Basics & Bridge Structural Analysis

Workshop Location

**College of Engineering
and Applied Sciences
Parkview Campus
Western Michigan University
Kalamazoo, MI**

Detailed location information
provided upon registration

Hands-On Training Using SAP 2000 Software

- Generate complex bridge models (Skew and Curved Bridges)
- Conduct analysis under AASHTO specified loads
- Perform model generation and verification
- Interpret results

Finite Element Basics & Refined Bridge Structural Analysis

Workshop Objective

This workshop will cover the fundamentals of finite element analysis for modeling and analyzing complex structures. The workshop will also include instruction on interpreting the analysis results. The knowledge and skills developed through this 2-day workshop will help participants develop and analyze complex FE bridge models using SAP 2000 software or any comparable software.

Hands-On Training

This workshop will include hands-on use of the SAP 2000 software. Every participant will be assigned a workstation and will generate complex bridge models, conduct analysis under the AASHTO specified loads, and interpret the results following step-by-step directions.

Who Should Attend

Bridge engineers from state departments of transportation, county road commissions, county/city engineering departments and engineering consultants should attend this workshop.

Cost

The cost of this 2-day workshop is \$780. All computer lab and software license fees during the training are included. The registration fee includes all training materials, lunch and break refreshments. Please let us know if you have any special dietary needs.

Registration

To register, call the Michigan LTAP office at (906) 487-2102. Class size is very limited; please register as early as possible to ensure your participation. Session choice will be assigned on a first come, first served basis. Due to the limited seating available, the following cancellation policy applies:

Cancellation after May 9: \$30 administrative fee.

Cancellation after May 30: 50% of workshop fee, unless the seat can be filled.

Workshop Location

College of Engineering and Applied Sciences (Parkview Campus) at Western Michigan University, Kalamazoo, MI.

Lodging

Participants are responsible for their own lodging expenses. Lodging options will be provided when you register.

Agenda

First Day

8:00 *Welcome and Agenda Overview*

- Introduction to finite elements
 - ◆ Finite elements and FE analysis tools
 - ◆ Demonstration of straight bridge analysis and comparison of girder moments calculated from AASHTO LRFD simplified analysis
 - ◆ Demonstration of a horizontally curved bridge analysis and discussion on AASHTO requirements for refined analysis
 - ◆ FE models for structural component description and element types used in the curved steel girder bridge example
 - ◆ Element types and selection procedure
- Introduction to SAP 2000 Nonlinear
- Bridge structural analysis with various element types – hands on training

4:00 *Discussion and Q/A*

Second Day

8:00 *Skew Bridge and Curved Bridge Analysis*

- Model generation
- Boundary conditions
- Model verification
- Load application and combinations
- Analysis & Interpreting analysis results

4:00 *Discussion and Q/A*

Training Materials Provided

A manual that includes finite element basics and step-by-step guidelines for developing skew and curved bridge models. Skew and curved bridge models will be provided on a CD.

Continuing Education Units (CEU)

Workshop participants are eligible for 1.6 CEUs.

Instructors

Haluk Aktan, Ph.D., PE

Dr. Aktan is a Professor in Civil/Structural Engineering and the Chairman of the Civil and Construction Engineering Department at Western Michigan University. He has been an educator for more than 25 years and is an expert in finite element analysis, structural dynamics, structural analysis, and bridge engineering.

He has been the Principal Investigator on Michigan DOT funded projects investigating bridge structural system design and performance using advanced finite element modeling and analysis. He has been a consultant to private and public agencies dealing with failure investigation through the use of advanced finite element modeling and analysis of reinforced concrete and steel structural systems.

Upul Attanayake, Ph.D

Dr. Attanayake is a Research Associate in the Department of Civil & Construction Engineering at Western Michigan University. He is currently teaching graduate courses on Advanced Structural Analysis and Finite Element Applications and is the finite element expert at the Center for Advanced Vehicle Design and Simulation (CAViDS) at WMU.

Upul has worked on multiple Michigan DOT sponsored research projects evaluating structural bridge system performance using advanced finite element concepts. He has conducted several short courses on structural analysis using SAP 2000, finite element model development, analysis, and results interpretation of complex structures using ABAQUS (general purpose finite element analysis program) and HyperMesh (finite element Pre- and Post processor).

Workshop Sponsors



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