AMERICAN SOCIETY OF CIVIL ENGINEERS

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New Webinar

Vibration of Concrete Floors – Evaluation, Acceptance and Control

Sponsored by ASCE Continuing Education and ASCE's Structural Engineering Institute (SEI)

THURSDAY, February 17, 2011
12 Noon - 1:30 pm Eastern Time

PURPOSE AND BACKGROUND

Evaluation of floor vibration is an essential serviceability check of modern building structures, where imaginative architectural layouts, advances in structural analysis techniques, improvements in construction material, coupled with owners and users demands, lead to longer and thinner spans oftentimes with irregular support layouts. Common human activities, such as foot drop, can result in vibrations in large open space office areas, residential or shopping malls. Such vibrations, where perceived, can be unacceptable. Hospitals and certain laboratories are likely to be subject to more strict levels of vibration.

This webinar starts with a review of the causes of vibration from human activities, perception of vibration by the occupants, and the level of acceptance of vibration for different occupancies. The discussion is followed by methods for quantifying the source of vibration, the characteristics of a floor system for transmission of vibrational impulse, estimate of a floor's response and the assessment of its acceptability. Different procedures for estimating the vibration response of concrete floors will be presented next. Starting from a simple and approximate method for a quick and rough assessment, the presentation progressively moves to the introduction of rigorous, yet practical procedures intended for design engineers in evaluation of vibration characteristics of concrete floors. The review extends to allowance for crack formation under service condition and its impact on vibration response. Numerical examples that follow each procedure introduced clarify the application and the level of approximation.

The presentation also covers the application software for the vibration assessment of concrete floors and to vibration of post-tensioned slabs, where applicable.

LEARNING OUTCOMES

- Acceptable level of vibration in buildings
- Parameters that influence the vibration response of floor systems
- Available methods in estimating the vibration response of a floor
- Selection of a suitable method and the applicable parameters for estimating the vibration response of a floor system
- Evaluation of vibration response of a floor system for acceptability
- Application of software specifically tailored to determine the vibration of floor systems

SEMINAR BENEFITS

- Learn to quantify the source of vibration of concrete floors, the threshold for perception of vibration by occupants, and the level of its acceptability for residential buildings, offices and hospitals
- Find out about the available practical procedures and tools in estimating the vibration of a concrete floor system
- Through numerical examples offered, develop the skill of making a quick assessment of vulnerability of a concrete floor to vibrations, warranting a more detailed analysis
- Become familiar with the critical characteristics of a concrete floor that govern its vibrational response, and the means to control and dampen the effects
- Observe the application of a software specifically tailored for vibration assessment of concrete floor systems, and attain an overview of the spectrum of available means for vibration evaluation
- Understand the impact of cracks in conventionally reinforced concrete on their vibration response
- Discover the impact of post-tensioning on vibration of concrete floors
- Earn 1.5 Professional Development Hours (1.5 PDHs)

INTENDED AUDIENCE

Structural engineers, building officials, plan checkers, and students engaged in vibration evaluation of conventionally reinforced or post-tensioned floor systems, who are seeking to learn about practical procedures for estimating floor vibrations and its acceptance for specific applications will benefit from this webinar.

SEMINAR OUTLINE

- Causes of vibration, with emphasis on foot drop and human activities
- Perception of vibration, threshold and limits of its acceptance
- Quantification of foot drop in different floor types and layout
- Floor system properties critical in intensity and transmission of vibration
- Methods of estimating the vibration response of given floors
- Current approximate and detailed tools and procedures for estimating the vibration response of a concrete floor
- Numerical examples for vibration evaluation of actual floor systems

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THURSDAY, February 17, 2011 / 12 Noon – 1:30 pm Eastern Time

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Information/Registration:

SEMINAR INSTRUCTOR

Bijan O. Aalami, Ph.D., M.ASCE, is Professor Emeritus of San Francisco State University, Life Member of the Post-Tensioning Institute, Chartered Engineer, and a Principal of ADAPT Corporation – a structural engineering firm in California specializing in design of concrete structures, and providing design software for concrete consulting firms. He has been actively engaged in the design and construction of numerous concrete buildings, bridges and special structures, in particular post-tensioning. A renowned world leader and teacher in the design of concrete buildings, bridges and special structures, through his worldwide educational seminars in over 20 countries, Aalami has enriched the practice of many engineers in North and Latin America, Far East, Europe and Middle East. His extensive publications on concrete design, in particular post-tensioning, are the principal resource for practical design of conventionally reinforced or post-tensioned floor systems and bridges. Aalami has been the project leader of the software suite ADAPT that is serving concrete design engineers in over 70 countries worldwide.

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