



UNIVERSITY OF CAPE TOWN

Vibration Serviceability of Civil Structures: Design and assessment of structures for vibration.

The Department of Civil Engineering at the University of Cape Town is offering a 2-day Continuing Professional Development (CPD) course on Vibration Serviceability of Civil Structures. The course can be attended either in Johannesburg, Durban or Cape Town.

Johannesburg	25-26 August 2008
Durban	28-29 August 2008
Cape Town	1-2 September 2008

Presenters

Professors Aleksandar Pavic and James Brownjohn, University of Sheffield, United Kingdom

ECSA Validation Number: UCTCIVSTRVES01-08 (2 CPD points)

Background

There is a growing trend to use slender structural forms in the design of elegant civil engineering structures such as footbridges, floors and grandstands. This slenderness combined with more onerous dynamic loading leads to increased susceptibility to excessive structural vibrations. As this increased slenderness is a trend which is likely to remain in civil and structural engineering, it is necessary to develop a reliable and efficient means for the vibration serviceability design and assessment of the slender structures.

The purpose of this course is to equip engineers with the state of the art on design and assessment of civil structures for vibration serviceability. The course will be presented by leading experts in the field of vibration serviceability, Professors Aleksandar Pavic and James Brownjohn of the Vibration Engineering Section (VES) at the University of Sheffield (UK). VES is a leading international centre of excellence on vibration serviceability and has been developing analytical and experimental tools for design and assessment of civil structures for vibration serviceability for over 15 years. VES' pioneering work on vibration serviceability includes stochastic modelling of human dynamic loads on structures and FE model correlation and updating for civil structures. Some of their work has been incorporated into the latest set of UK and international design guidelines: The Steel Construction Institute, UK, (2007) "*Design of Floors for Vibration: A New Approach*", The Concrete Centre, UK, (2006) "*A Design Guide for Footfall Induced Vibration of Structures*", The Concrete Society, UK, (2005) "*Post-Tensioned Concrete Floors - Design handbook*". The Institution of Structural Engineers, UK, (2002) "*Dynamic testing of grandstands and seating decks. Advisory Note*", The Institution of Structural Engineers, UK, (2001) "*Dynamic Performance Requirements for Permanent Grandstands Subjected to Crowd Action. Interim guidance on assessment and design*".

Who should attend?

The course is intended for structural and civil engineers involved in the design, construction and management of civil structures. The course will be relevant to engineers at all levels of professional development.

Course objectives

The course aims to provide participants with:

- State of the art on vibration serviceability.
- Brief theoretical basis for vibration serviceability.
- Practical design for vibration serviceability, including interpretation relevant codes of practice.
- Practical assessment of existing structures for vibration serviceability.
- Practical remedial strategies for vibration serviceability problems

Programme

Day 1

08:00 - 08:30	Registration
08:30 - 09:00	Introduction to vibration serviceability.
09:00 - 10:00	Brief review of theory of vibration.
10:00 - 10:30	Teak break
10:30 - 12:30	Brief review of theory of vibration.
12:30 - 13:30	Lunch break
13:30 - 15:00	Sources of vibration excitation, Design Criteria, Design process.
15:00 - 15:15	Tea break
15:15 - 17:00	Design process – FE modelling, modal mass, response analysis

Day 2

08:00 - 10:00	Design of floors for vibration– steel floors, concrete floors, hospital floors.
10:00 - 10:30	Teak break
10:30 - 12:30	Design of floors, grandstands, footbridges and car parks for vibration.
12:30 - 13:30	Lunch break
13:30 - 15:00	Dynamics testing for vibration serviceability.
15:00 - 15:15	Tea break
15:15 - 16:45	Retrofit & remedial strategies.
16:45 - 17:00	Closure

Registration

The course fee is R3 800-00. The registration fee will cover notes & handouts, refreshments & lunches and a certificate of attendance. The deadline for registering for this course is 31 July 2008. For further information contact:

Assoc. Prof. Pilate Moyo

Department of Civil Engineering, University of Cape Town, Private Bag X3

Rondebosch 7701, Cape Town

e-mail Pilate.Moyo@uct.ac.za

tel +27-21-6502592, mobile +27-72-1053366 fax +27-21-6897471

<http://web.uct.ac.za/staff/moyo/index.html>

About the guest presenters & course convenor

Professor A. Pavic, *CEng, MStructE, UK*, is currently Professor of Vibration Engineering at the University of Sheffield and heads the Vibration Engineering Section. His particular expertise is in vibration serviceability of slender civil engineering structures, such as long-span floors, footbridges and grandstands, which are occupied and dynamically excited by humans. His contribution has been recognised in state-of-the-art design guidelines which are currently used in the UK and internationally when checking vibration serviceability of floors and footbridges. He is a recipient of the prestigious 5-year Advanced Research Fellowship funded by the UK Engineering and Physical Sciences Research Council (EPSRC) to work on a novel *Stochastic approach to human-structure dynamic interaction*. He has authored and co-authored numerous publications and reports on vibration serviceability. Professor Pavic is a member of International Standardisation Organisation Working Group ISO/TC98/SC2/WG9 which updated ISO 10137 guidelines on serviceability of buildings against vibration in 2007.

Professor J.M.W. Brownjohn, *CEng, FIMech, MStructE, Deng*, is currently Professor of Structural Dynamics at the University of Sheffield. His academic career has revolved around experimental assessment of the performance of a range of civil structures, using full-scale dynamic testing, long-term monitoring and shaking table testing. His present research and professional interests include wind engineering, earthquake engineering, and structural health monitoring (SHM), finite element model updating, serviceability of vibration sensitive industrial facilities, system identification and biomechanics. Professor Brownjohn is involved in promoting developments in structural health monitoring through involvement in the International Society for Structural Health monitoring of Intelligent Infrastructure (ISHMII), the EU funded thematic network on Structural Assessment, Monitoring and Control (SAMCO) and the ASCE Committee on Structural Identification of Constructed Systems.

Professor P. Moyo is an Associate Professor at the University of Cape Town. He is the convenor of the course on Vibration Serviceability. His research is on structural health monitoring, condition assessment, vibration serviceability and repair strategies for civil structures. His work recognises that infrastructure management and renewal requires in depth understanding of the structural system of interest, material deterioration mechanisms and the loading environment. Thus his research is focused on developing a holistic approach for performance assessment structures by integrating modelling, experimentation and computation. He has published widely in these areas. Professor Moyo is actively involved with the South African Institution of Civil Engineering (SAICE) as Vice Chair of the Education and Training Committee and the Concrete Society of Southern Africa (CSSA). He is also Co-chair of the 2nd International Conference on Concrete Repair, Rehabilitation and Retrofitting (ICRRR).