

Foundations of Fire Safety in Civil Engineering

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FOREWORD

This work aims to set the basis for the first course of *Foundations of Fire Safety in Civil Engineering*, part of the *Fire Safety in Civil Engineering* discipline (which, in the current form, contains a course of *Fire Safety Engineering in Civil Engineering*), course and discipline which were initiated together with the start of Bachelor's and Master's programmes in the Bologna format.

The work is built around a comprehensive set of lecture notes and supporting notes for the *Fire Safety in Civil Engineering and Equipments* course, created in 2008 (L. Burlacu and D. Diaconu-Şotropa), but also contains the knowledge and experience gained by the author Dan Diaconu-Şotropa in the following years.

The work, with a branched structure containing 10 chapters, is mainly based on the NFPA Fire Safety Concepts Tree from 1997. The chapters referring to equipments with which buildings are provided, such as fire safety equipments (chapters 8 and 9), were taken from the before mentioned lecture notes, but with a large amount of changes and updates considered to be necessary by the author of this work.

Some pieces of information which may not be present in the current technical regulations have a documentary purpose, and are used for a better understanding of the material.

This work is aimed mainly at university students in Civil Engineering courses, but can also apply to Architecture, who desire to gain knowledge in the field of Fire Safety; the document is not meant to be used by students and professionals as a design guide, and is only meant to be used in an early stage of their studies in the field.

I hereby thank everyone who participated, directly or indirectly, to the writing of this work.

ABOUT THE AUTHOR



After graduating the *Faculty of Civil Engineering and Architecture* of the *Technical University "Gh. Asachi"* of Iași in 1981, the author's professional activity is as follows:

- 1981-1986, *Engineer*: Trust of Building Assembly, Iași;
- 1986-1990, *Engineer, Head Engineer*: *Seismic Research Centre*, Civil Engineering Mechanics, Faculty of Civil Engineering and Architecture of Iași (involved in *designing the nuclear power plants of Cernavodă and Koslodui*);
- after 1990, *Teaching Assistant, Lecturer, Associate Professor, Professor*: Civil Engineering Mechanics, Department of Structural Mechanics, Faculty of Civil Engineering and Architecture of the Technical University "Gh. Asachi" of Iași (teaching the following disciplines: *Computer Programming, Computer Aided Engineering, Numerical Methods, Fire Safety in Civil Engineering*);
- 2000-2003, *Director*: *Department of Continuous Education and Distance Learning in Civil Engineering, DECID-C*.

In May 1997 the author finalised his PhD titled *Response of structural systems to dynamics temperature variations*, at the Technical University "Gh. Asachi" of Iași.

The author is a member of a series of professional associations and technical committees:

- member of *CIB-W014 (International Council for Research and Innovation in Building and Construction - Fire)*;
- founding member of The Computer Aided Engineering Society (*SIAC – Romanian abbreviation*), secretary of the Iași branch;
- founding member of the *Academic Society of Civil Engineering ANTON ȘESAN (SACS)*, Technical University "Gh. Asachi" of Iași;
- member of the *Structure Designer Civil Engineers Association (AICPS)*;
- member in technical committees of the *Romanian Standardisation Association (ASRO)*: *CT343-Basis of design and eurocodes for structures (Fire Safety)*, *CT216-Fire safety equipment*, *CT 217-Fire Safety in Civil Engineering*;
- member in technical committees of *The Regional Ministry of Development and Tourism (MDRT)*: *Permanent Technical Council for Civil Engineering (Technical committee 1, 2, 3-fire*

safety), *CTS4-Actions concerning buildings* and *CTS11-Functional requirements in Civil Engineering and Physics of Civil Engineering* (where Fire Safety is included);

- founding member of The Romanian Association of Fire Safety Engineers (*ARISI*), president of the *Moldova* branch, in Iași.

The author took part in a series of scientific activities related to the topic:

- 2002, Sheffield University, United Kingdom, Thermo-deformability and Fire Safety Engineering;

- 2008, EUROCODES Background and Applications Bruxelles 18-20 February;

- 2008, participant, Conference main theme: Fire Safety of High-rise Buildings, May, 07-09, 2008, Bucharest, Romania;

- 2008, participant, Seminar “Structural Design for Fire Safety”, as part of the European project RFCS-DIFISEK+, Faculty of Civil Engineering of Timișoara, “Politehnica” University of Timișoara;

- 2009, participant “Meeting of CIB W14-Fire, Lund University, April 23-24, 2009”;

- 2009, participant “Human Behaviour in Fires: 4th Symposium, Cambridge, UK. July 2009”;

- 2012, participant, Seventh International Conference on Structures in Fire, SIF 2012, ETH-Zurich, June 6-8, 2012;

- 2012, participant, “5th International Symposium, Human behaviour in Fire 2012”, 19th-21th September 2012, Downing College, Cambridge UK;

The author initiated new research fields inside the Technical University "Gh. Asachi" of Iași:

- Numerical analysis of thermoderformable structures;

- Computer Aided Engineering for conductive heat transfer;

As a lecturer, the author initiated the teaching of new university courses:

- Master’s programme: *Fire Safety in Civil Engineering*, 2008;

- Courses: *Foundations of Fire Safety in Civil Engineering* (Bachelor’s engineering course) and *Fire Safety Engineering in Civil Engineering* (Master’s Engineering Course).

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