



### **“Design of concrete structures – Application of the Eurocodes 1992 as daily practice” Abstract of the lecture for CPD (Continuous Professional Development) program of the ECEC**

Lecture according to the action plan on Continual Professional Development (CPD) organized by the European Council of Engineers Chambers (ECEC).

Selected topics from design of reinforced concrete structures according to EN 1992-1-1

Reinforced and prestressed concrete is the most used structural material in building industry. Therefore Eurocode 2 (EC2) is very frequently used standard in the most of European countries.

Currently EC2 consists of four documents:

EN1992-1-1 Design of concrete structures. Part 1-1: General and rules for buildings

EN1992-1-2 Design of concrete structures. Part 1-2: Structural fire design

EN1992-2 Design of concrete structures. Part 2: Concrete bridges – Design and Detailing rules

EN1992-3 Design of concrete structures. Part 3: Liquid retaining and containment structures

The fourth part EN1992-4 Design of fastenings for use in concrete is under process of formal vote and soon will become valid standard.

The next webinar will offer information about two the most disputed topics concerning design according to EN 1992-1-1. The first one is design of slender columns and the second one is punching.

Eurocode 2 for design of concrete compressed slender members according to nonlinear design method has a deficit in global reliability. We will be dealing with analysis of results of experimental and numerical verification of slender concrete columns. A basic aim of the analysis is to design concrete columns subjected to bending moment and axial force where the stability failure proceeds the strength failure the critical cross-section. Experimental and numerical analysis of the columns with the verification of global reliability.

Punching belongs to the most dangerous modes of structural failure due to its brittleness. Currently used model for assessment of punching resistance is empirical and was developed in the 70s. The model has many disadvantages and in some cases overestimates punching resistance. Therefore two new models are under consideration to replace current model within the works on the second generation of Eurocodes. The first one is mechanical model based on the critical crack shear theory (CCST) and the second is enhanced EC2 model proposed by German group. The lecture will offer

deeper information about design for punching according to current EC2 including some examples and brief information about above mentioned two new models including statistical evaluation of their safety.

The webinar offers the possibility to receive selected information about important background features of the European Standards EN 1992 and to learn how to optimize the practical application.

Lecturer:

**Prof. Dipl. - Ing. Dr. Vladimír Benko, PhD.**

- Full professor the Slovak University of Technology in Bratislava,
- Lecturer at Vienna University of Technology
- Chartered Engineer in Structural Design and Architectural and Engineering Services
- Member of the the national code committees: Actions on structures, Concrete Structures, Earthquake design and Mirror Committee for Eurocodes in Austrian Standard Institute and Slovak

**Prof. Ing. Jaroslav Halvonik, PhD.**

- Full professor the Slovak University of Technology in Bratislava,
- Chartered Engineer in Structural Design and Engineering Services
- Representative of Slovak republic in CEN / TC 250 Structural Eurocodes
- Member of CEN/TC 250/SC2/WG1/TG4 Shear, Torsion and Punching
- Member of the national code committees: Actions on structures, Concrete Structures and Mirror Committee for Eurocodes