

One-Day Seminar on Adopting Eurocode for Structural Steel Design (EC3) in Malaysia



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THIS One-Day Seminar organised by IEM Civil and Structural Engineering Technical Division (CSETD) with the support from Department of Standards Malaysia (DSM) was held on 14 December 2011 at Armada Hotel and was attended by 41 participants. There were six Speakers for this Seminar on adopting EC3 in Malaysia.

SESSION 1:

INTRODUCTION TO EC3/MALAYSIA ANNEX

Ir. Prof. Dr Jeffrey Chiang Choong Luin gave some background information on Eurocodes and the reasons for the adoption of Eurocodes in Malaysia. The main parts of Eurocode, the format and philosophy, and the Eurocode terminology, symbols and annexes were introduced. The concept and purpose of the National Annex, the partial safety factors for yielding, buckling and fracture, and the ductility requirements and deflection limits were clarified in the MS EN1993 National Annex.

SESSION 2:

INTRODUCTION TO EC0 AND EC1

Ir. M.C. Hee elaborated on EC0 (Basis of structural design) and EC1 (Actions on structures) and on the terminology used in the Eurocodes. The actions (permanent, variable, accidental and earthquake), load/material safety factors and the components of ULS fundamental combination equation, Eq 6.10 EC0, were explained.

There were also detailed explanations on ULS and SLS combination equations and its relation to deflection limits (vertical and horizontal deflections) and braced and unbraced frame structure.

SESSION 3:

PREVIEW OF SECTION BEHAVIOUR/ CONNECTIONS

Engr. Dr Nor Hafizah bt. Ramli @ Sulong presented an overview of section classification, limits on slenderness in terms of width-to-thickness ratios for plate elements, tension, compression, bending moment and shear resistance on the Sections. The combined loading of bending and shear and bending and axial force for elastic and plastic conditions was also explained. The other topics presented include the basis of design for bolted and welded connections for H, I and hollow sections, design moment resistance of joints and rotational stiffness.

SESSION 4:

MEMBER BEHAVIOUR

Ir. Tu Yong Eng demonstrated with a design example to illustrate the design procedure for BS 449, BS 5950 and MS EN 1993-1-1 in terms of bending, shear and lateral torsional buckling as the comparison for these Standards. The use of flow charts and design aid tables published by Access Steel was also mentioned.

SESSION 5:

FRAME BEHAVIOUR AND STRUCTURAL ANALYSIS

Prof. Dr Shahrin bin Mohammad stated that EC3 Design of Steel Structures is based on limit state design principles and have to be checked for both ultimate and serviceability conditions. The frame design is checked for static equilibrium, frame stability, resistance of cross-sections, members and joints.

The other topics as explained include sway stability and resistance, frame imperfections for multistory steel frame and the moment resistance, rotational stiffness and capacity of joints in the form of moment-rotation curves. The frame classification and frame behavior and the frame analysis and design i.e. either elastic or plastic global analysis using 1st and 2nd order analyses was also discussed.

SESSION 6:

RELIABILITY ANALYSIS IN EUROCODE

Ir. Mun Kwai Peng emphasised the importance and relevance for reliability analysis in Eurocodes for the Management of Structural Reliability for Construction Works (Annex B) and the Basis for Partial Factor Design and Reliability Analysis (Annex C). The use of factors applicable to actions for reliability differentiation (beta, partial factors) and the Reliability Index together with the probabilistic methods to the consequences of failure and structural reliability were highlighted.

The closing ceremony speech was by En. Rafaiq bin Bakri, from the Department of Standards Malaysia. Lastly, the Civil and Structural Engineering Technical Division proceeded to register a note of thanks and presented tokens of appreciation to the Department of Standards Malaysia for their support and to all the Speakers, to the applause of the participants. ■