

**1 – day workshop on “Conceptual Design of Structures”**

by Ir. Chong Chee Meng

Ir. Chong Chee Meng is currently the chairman in Civil and Structural Engineering Technical Division (CSETD).

The Civil and Structural Engineering Technical Division (CSETD) and The Institution of Structural Engineers (Malaysia Regional Group) have jointly organized a 1-day workshop on ‘Conceptual Design of Structures’. The 1 day seminar was held on 2nd October 2019 at Armada Hotel. The speaker was Mr. Rajavel Inbarajan, who has more than 25 years of quality and varied experience in conceptual design, detailed design and project management of very large structural and civil engineering projects in international and cross cultural set-up. Mr. Rajavel has been appointed by IstructE as an examiner for the Chartered Membership Examination in 2008 and continues this prestigious role ever since.

This seminar was chaired by Ir. Prof Dr Zamin, committee member of CSETD and was attended by 70 participants. The 70 participants included engineers from engineering consultants, contracting firms, government agencies and local authorities as well as faculty members from local institutions of higher learning.

The seminar was divided into 4 sections. In section 1, Mr. Rajavel commenced his talk by briefly explained the history and heritage of civil and structural engineering. The history of civil and structural engineering can be divided into 4 eras i.e. ancient era, middle era, renaissance era and modern era. Mr. Rajavel also shared some of the historic civil engineering construction such as pyramid, Qanat water management system, Appian Way and Great Wall of China.



Mr. Rajavel delivering the talk

In section 2, Mr. Rajavel concentrated on conceptual design process which included aim of structural design, conceptual design, structural forms, rules of thumb in structural engineering and approximate method analysis. Mr. Rajavel explained that the aim of structural design is to have a simplified, easy to construct and sustainable structure. The engineers need to determine the structural scheme and structural form to be used. Mr. Rajavel shared with the participants some of the rules of thumb in structural engineering to estimate the beam and slab sizes and how to quickly calculate the bending moment and shear force for structural frame using approximate method analysis such as portal method and cantilever method. The participants required to finish 5 examples exercise before break for lunch.

After lunch, Mr. Rajavel continued with section 3 which was on guide to structural robustness and disproportionate collapse. In Eurocode 1, robustness is define as the ability of a structure to withstand events like fire, explosions, impact or the consequences of human error without being damaged to an extent disproportionate to the original design. As per Approved Document 'A', for robustness design, the building can be divided into 4 classes i.e. Class 1, 2A, 2B and 3 buildings. The common approaches found in the codes for robustness design are tie-force based design method, alternative load paths method, key element design and risk based methods.

In section 4, Mr Rajavel shared with the participants the probable solution to ISructE chartered membership examination questions. The questions are library building, emergency generator building, new city centre office block and flood alleviation tank.

At the end of the talk, there were questions raised by the audience which Mr. Rajavel answered and clarified in more detail. At the end of the event, the Session Chair invited CSETD chairman, Ir. Chong to present a token of appreciation to Mr. Rajavel.



Presentation of memento by Ir. Chong to Mr. Rajavel