

# The 17th Professor Chin Fung Kee Memorial Lecture

By: *Engr. Dr. Ooi Teik Aun*, FIEM, P Eng,  
Organising Chairman

The 17th Professor Chin Fung Kee Memorial Lecture, jointly organised by The Institution of Engineers, Malaysia and the Engineering Alumni Association of The University of Malaya, was held on Saturday, 8 September 2007 at 1.30 p.m. at the IEM Conference Hall, Bangunan Ingenieur. The lecture was well attended by about 80 participants (see Figure 1).

The lecture, entitled 'The Design, Assessment and Strengthening of Bridges using Advanced Modelling Techniques and Modern Codes of Practice', was delivered by Mr. Chris Hendy, Head of Bridge Design and Technology, Atkins Highways and Transportation in the United Kingdom (Figure 2).

The lecture highlighted the modern design and assessment of bridges using advanced global analysis modelling techniques that, due to the limitations of computing power, would have, until recently, been applicable only to very localised areas of structures. The use of such models potentially allows a greater efficiency in design to be obtained, but the complexity can also make it more difficult to check the results by simple means. Thus, rather than reducing the need for engineers to understand the behaviour as might be expected, it necessitates a much greater understanding to enable designers to check the results and produce error-free designs. The move to complex architecturally-led bridges can make this checking a very difficult process.

An error-free analysis can still produce a poor design if the analysis method is inappropriate or if the implications of localised high stresses are not understood. In particular, the use of elastic finite element analysis may be very conservative if the designer considers that the ultimate load has been reached when yield is attained only in highly localised areas; plastic redistri-



Figure 1: A view of part of the participants.



Figure 2: Chris Hendy delivering his lecture.



Figure 3: Organising Chairman Engr. Dr. Ooi Teik Aun presenting a memento to Chris Hendy.



Figure 4: Organising Committee together with Chris Hendy and his assistants.

bution after yielding may often allow the load to arise considerably beyond that at first yield.

With the appropriate understanding and checking, modern complex modelling techniques can predict design resistances that are very close to the 'real' resistances. This is especially important in the assessment of existing bridges where maximising the calculated resistance available is essential if strengthening work is to be avoided.

The lecture looked at modern modelling techniques for the efficient design and assessment of a variety of different generic bridge types including prestressed concrete bridges, steel box girder bridges and cable-supported bridges. It also looked at the improved resistances that the new Eurocodes

bring, which often negates the need for advanced analysis. Much of this codified advancement has come from parametric studies with computer models, rather than expensive physical testing. The implications of these increased resistances on structural reliability are discussed, as is the increased need to fully understand structural behaviour as the complexity of construction increases and the margins of safety reduce.

The lecture ended at 3.30 p.m. Engr. Dr. Ooi Teik Aun, the Organising Chairman, presented Mr. Hendy with a souvenir and a Certificate of Appreciation (Figure 3). The Organising Committee members also took a group photograph with Mr. Hendy and his assistants (Figure 4). ■