



*By Engr. Liew Shan Chin*

This seminar organised by IEM Civil and Structural Engineering Technical Division and was held on 28 February 2011 at Empire Hotel, Subang Jaya. The seminar was attended by 133 participants and was supported by Creative Precast Technics Sdn Bhd, Meinhardt (Malaysia) Sdn Bhd and Rivo Precast Sdn Bhd

The speaker, Dr Peter Gabor, started off the seminar by giving a brief introduction on STM (Strut and Tie Model). STM has a long history in the reinforced concrete design and this method has been used for at least 100 years but first gained wider acceptance in the early 90's.

Dr Peter Gabor explained validity of STM in reinforced concrete structures. STM can be applied in the structures where there are geometrical and/or load discontinuities. It is usual for this area to suffer from irregular and disturbed stress flow that demands highly complicated design and detailing. There are two requirements should one choose to adopt STM, namely; equilibrium of forces and (2) stress-strain relationship of yield criterion of different materials.

The speaker also presented load path method – a powerful tool for the presentation of STM especially in the absence of a linear elastic analysis. He continued his presentation on three constituents of STM, namely the Strut, the Ties and the Nodes. Basically, the Struts are the compressive members in STM, the Ties are the tension members in STM and the Nodes are the points where the incoming strut and tie centerlines, external point loads or resultants of uniform loads and support reactions meet.

Dr Peter Gabor illustrated some of the frequently used, yet simple STM applications such as a typical deep beam loaded uniformly on two supports, load transferred through wide column, wall with large openings and etc. To simplify the procedures, he also presented thirteen straightforward steps for any STM design. He also discussed some typical details which are commonly used, such as corbels, half-joints, knee joints, voids in beam and *etc.*



The speaker demonstrated 4 more complex designs by employing the STM method. One of the examples is continuous transfer beams at Telecom HQ in Kuala Lumpur. Dr Peter Gabor explained how this beams were designed using STM method. He also compared STM method results with Finite Element method results.

There was lively discussion between Dr Peter Gabor and the participants during the Q&A session. The seminar adjourned at 5.00 p.m. with the note of thanks to Dr Peter Gabor and a token of appreciation, to the applause of the participants.