Talk on "Civil Engineers' Role in Green Buildings"

by Dr Sudharshan N.Raman

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The Talk on "Civil Engineers' Role in Green Buildings" was organised by the Civil and Structural Engineering Technical Division on the Wednesday, 20th July 2016, at the Tan Sri Prof. Chin Fung Kee Auditorium at Wisma IEM, Petaling Jaya. The course Instructor, Ir. TL Chen, is a practising Mechanical Engineer with over 35 years of experience in the building services industry, and has previously served as the President of the Association of Consulting Engineers Malaysia (ACEM), ASHRAE Malaysia Chapter, the Institution of Fire Engineers Malaysia (IFEM), and the Kiwanis Down Syndrome Foundation. He is also an ASHRAE Distinguished Lecturer and was the recipient of the ACEM Gold Medal Award in 2010.

The course attracted a total of 46 participants which included engineers from engineering consultancy practice, contracting firms, government agencies and local authorities, as well as faculty members from local higher learning institutions. The ratio of participants represented a good mix of young engineers and experienced practitioners.

Ir. Chen's lecture was generally focussed on highlighting the role that Civil Engineers "can, should and "are required" to play to realize the sustainability (Green) agenda in the built environment framework and on the need for a more holistic design approach by all relevant players towards "greening the construction industry". He highlighted that the built environment in general:

- Are responsible for 40% of the world's global greenhouse gas emission;
- Use 12% of the world's water;
- Are responsible for 40% of the global solid waste generation;
- Utilise one third of the world's resources; and
- The air quality in buildings contains up to five times more pollutants than the outdoor air.

The concept of green (or sustainable) buildings was founded to address sustainability needs, where the design of sustainable structures should encompass holistic integrated design approach addressing the needs of climate, energy, water, environment, ecology, community, planning, design, transport, connectivity, building, resources, business and innovation. Green or sustainable buildings:

- Are designed to save energy and resources, recycle materials and minimise the emission of toxic substances throughout its life cycle;
- Harmonise with the local climate, traditions, culture and the surrounding environment;
- Are able to sustain and improve the quality of human life whilst maintaining the capacity of the ecosystem at local and global levels;
- Have many benefits, such as better use of building resources, significant operational savings, and increased workplace productivity; and
- Sends the right message about a company or organisation – that it is well run, responsible, and committed to the future.

Ir. Chen illustrated with an example of how the lack of greenery within a housing or a township development can intensify the urban heat island (UHI) effect, and that proper site planning can influence the micro-climatic condition in an urban environment and reduce the UHI effect. He went on to discuss on various sustainable technologies available to enhance energy efficiency and overall green characteristics in the built environment. These include evaporative cooling, chilled beam and chilled slab systems, underfloor air distribution system (UFAD) systems, dedicated outdoor air system (DOAS), solar thermal cooling (STC) systems, façade engineering, wind force harvesting systems, geothermal energy, phase change materials (PCM), etc. Ir. Chen ended the first part of his lecture by discussing on several local and international case examples which had leveraged in these technologies to "create" energy efficient and zero energy sustainable buildings. These included the Malaysian Securities Commission Building, The BCA Academy in Singapore (Singapore's first retrofitted Zero Energy Building), the Malaysian Energy Commission Diamond Building in Putrajaya, and the CH2 Tower of the Melbourne City Council in Australia.

The second part of the lecture focussed on sharing the features of various Green Rating Tools from around the globe and how these tools act as the driving force of sustainability in various industries and services. The evolution of the Malaysian green rating tool, the Green Building Index (GBI) was shared next. Ir. Chen highlighted on how the Association of Consulting Engineers Malaysia (ACEM) and Pertubuhan Arkitek Malaysia (PAM) came together to develop GBI and at the same time assisted in the formation of the Malaysian Green Building Confederation (MGBC) which spearheads the green built environment movement in Malaysia. The detailed characteristics of GBI was shared next, where the weightage for various sustainability contributors, namely energy efficiency, indoor environmental quality, site management, materials and resources, water efficiency and innovation; and the GBI rating categories were explained.

Ir. Chen concluded his lecture by sharing on how these green tools facilitate in driving and promoting the green agenda of nations around the globe, and on how the industry players are moving forward in addressing these sustainability issues using these green tools in the current challenging times. This was then followed by a question and answer session, during which the participants took the opportunity to raise their queries and doubts, and was involved in a lively discussion with the speaker. In concluding the event, the Session Chair, Dr. Sudharshan N. Raman thanked the speaker for delivering the informative talk, and presented the token of appreciation to Ir. TL Chen.

Ir. TL Chen addressing the participants during the lively Q&A session