Building Green: Challenges Faced by Engineers

by ***Suvarna Ooi***

ACCORDING to the United States Environmental Protection Agency, green building is the practice of creating structures and using processes that are environmentally responsible and resource-efficient throughout a building's lifecycle from design, construction, operation, maintenance, renovation and even deconstruction. In other words, a green building is also known as a sustainable or high performance building.

The need for building green arose out of the need and desire for more energy efficient and environmentally friendly building practices. However, in Malaysia, the demand for such buildings is not as widespread due to many reasons. JURUTERA met up with Ir. Chen Thiam Leong to find out his views on the local effort to build green.

Ir. Chen has over 30 years of experience as a building services consulting engineer both locally and overseas. Among others, he was the past president of the Association of Consulting Engineers Malaysia, the Institution of Fire Engineers Malaysia and ASHRAE Malaysia Chapter. He has been involved in a number of major projects including the Kuala Lumpur International Airport, Kuala Lumpur Convention Centre and Dayabumi Complex. More recently, he led the drafting of the Green Building Index (GBI) rating tools and is currently involved in GBI training program nationwide.

Ir. Chen stated that the first challenge for local engineers is to change their mindset to take cognisance that they can take the lead in building green buildings and not be confined to their respective narrow scope of technical *per se*. However, he explained that, to be recognised and accepted for such ability, engineers must be prepared to continually update their knowledge and discard conservative and safe approaches.

To do so, many local engineers will need to shed their 'cut and paste' reputation, which they have been contentedly practising for decades and which, unfortunately, had been imparted to the new generation of engineers. Ir. Chen said, "Such examples are plentiful ranging from the 'cut and paste' use of colonial dated specifications to full-scale copying of latest foreign designs, specifications or practices without localised modifications to suit the local climate and conditions."

Having said that, he acknowledged that there are also local engineers who have excelled in their quest to become industry leaders in building green. However, most of these pioneers tend to ply their trade and expertise overseas because the local market is either not ready or the dreaded 'Gucci Syndrome' prevails.

Ir. Chen stressed that the effort to build green was also affected by the lackadaisical attitude of engineers in the built industry due to the lack of opportunities (often as the result of non Quality Based Selections in appointments),

unappreciative owners and project team members. This was compounded by the proliferation of low expertise or even non-quality service providers courtesy of the lax legal qualification requirements over the past decades.

In addition, local engineers were often relegated to be a backroom members of the design or project team traditionally led by architectural practices and, as such, are dependent upon the architect's leadership in building green. He said, "There are not enough green building champions especially amongst the traditionally subdued local engineers who preferred not to venture outside of their safe domain."

Another challenge faced by local engineers is the lack of good and passionate leadership in engineering bodies to strive for excellence in the various engineering fields. Ir. Chen felt that this is because there has been a tendency for engineering organisations to duplicate effort rather than address other neglected areas of engineering to complement each other's progress.

He said, "The BEM's (Board of Engineers, Malaysia) mandatory fee structure had also unwittingly discouraged innovation. For example, with fee payment based on the percentage of engineering installation costs, designing for natural ventilation or daylighting equates to zero engineering installation costs, hence zero fee payment."

Public awareness on the need for sustainable developments has also taken hold rather slowly. This had, in turn, led to a low demand for green buildings. Ir. Chen also believes that the populist policy of maintaining low energy tariffs has obviously contributed to the hitherto lacklustre progress of energy efficient buildings, which would otherwise have spurred the growth of green buildings much earlier.

OVERCOMING CHALLENGES

One favourite quote of Ir. Chen is, "Engineers can even build you a bridge to the moon – it is a matter of cost and time, *aka* value for money". With this in mind, he believes that all the aforementioned challenges can be overcome with ease provided the engineering fraternity looks at the big picture.

To begin with, he stressed that local engineers need to come out of their comfort zone and rejuvenate their passion for the engineering discipline. To achieve this, they must be ready to embrace and adopt cutting edge technologies in their designs and approach. This applies to all facets of the engineering profession be it the consulting engineers, contractors, manufacturers, vendors, academicians, *etc*.

He said, "The urgency for this approach is especially critical for service providers (consulting engineers) as they must innovate or risks being sidelined when the services industry is fully open to the world in 2012."

In addition, local engineering organisations must also learn to complement their resources instead of duplicating less demanding effort at the expense of other more challenging engineering fields. The respective roles must be diligently pursued to maximise the advancement of engineering.

Ir. Chen said, "There is so much to be done to safeguard our environment for the future and there is simply no time to waste as we need to progress from green buildings to green townships and a green built nation."

BUILDING GREEN: GOING FORWARD

In Southeast Asia, Singapore was the first country to develop a Code of Practice on Energy Efficiency for the built industry. This was closely followed by Thailand and Malaysia. However, in terms of the Green Building Rating System, Singapore was the first to adopt the system in 2005 followed by Malaysia last year. While Thailand is still struggling, Indonesia has approached Malaysia for advice.

The green building movement in Malaysia, just like any other country, is starting to develop in tandem with its growth, affordability and readiness, amongst other factors. Ir. Chen said, "We could have perhaps started 2 to 3 years earlier, but that delay has now been more than adequately mitigated with our accelerated progress over the past 12 months."

In the global scenario, he lauded the Malaysian government's effort in providing generous tax exemption incentives for green buildings. He said, "At the November 2009 World Green Building Council conference, our GBI representatives were given a standing ovation when we announced the incentives given by the Malaysian government, which has set a benchmark for others to emulate."

With such fiscal incentives, he believes that Malaysia's effort to build green is in a good position to surpass the initial pace of many other countries. In terms of technological knowhow, he said, "We have the expertise as well that suits our country's needs and the Green Building Index together with MGBC (Malaysia Green Building Confederation) are embarking on strategies to accelerate the training."

Due to the poor publicity accorded to the engineering profession, many iconic buildings are associated with the architects involved but never the engineers behind the scene. For example, Ir. Chen pointed out that many people were not aware that one of the country's award winning buildings, designed by local engineers, is the first building in the world to implement an UFAD (Under Floor Air-conditioning Distribution) system with a totally ductless and non insulated raised floor plenum exceeding 600 m^2 per cooling zone. This achievement is certainly notable as worldwide practice limits ductless cooling zones to no more than 300 m^2.

Ir. Chen Thiam Leong

Prior to this local project, all publications have advised against exceeding this limit. Many experts also believed that a non-insulated UFAD air plenum in an equatorial climate application may not be possible due to condensation issues. He said, "Now that we have set a benchmark, the world is learning from us. Unfortunately, it is also common knowledge that many of our own local engineers remain ignorant of the home success, courtesy of their 'cut and paste' attitude and adoption of zero risk approaches."

Local engineers should learn, improve, modify and localise for implementation wherever feasible. Likewise, Ir. Chen advised that local engineers should be prepared to share their knowledge and experience for others to improve upon and for them to in turn gain from the improved versions of others. He said, "Whilst local engineers can and should certainly learn from the advanced countries who definitely gain from their better R&D facilities and opportunities, it is also time for us to encourage our local R&D."

According to him, the government has already given the best incentives in terms of full 'Green Cost' tax exemptions until the end of 2014. He also pointed out that there are also other incentives that can help to further accelerate building green for which some local authorities are beginning to implement, such as increased development density.

Ir. Chen explained that, "The next stage would be to extend incentives to end users to ensure sustenance of green buildings. A viable proposal would be a reduction in assessment rates to reward such buildings which, after all, will produce less waste and less pollution and hence cost the local authorities less to maintain."

Being the largest building owners, he believes that the government could lead the effort by greening all their existing building stock and stipulating all their new buildings to be green rated. He added that the government's assistance is also needed to fairly 'reward' new green building owners in terms of reduction in capital cost contribution for utilities, such as the water concessionaires, sewerage concessionaires, etc.

In addition to this, the industry and public at large must also take responsibility for building green. They should not merely wait for or rely on government incentives or leadership in many other related areas including eco-labelling of products, advancing recycling and landfill facilities, coming out with reuse material products and so forth.

Simply put, Ir. Chen believes that there are plenty of opportunities for engineers in the green built industry. He added that engineers will inevitably play the most crucial role if the earth is to survive as mankind will not be willing to sacrifice all the luxury and comfort they have been accustomed to. ■