



# HEIGHTS

Volume 1

Construction, from a New Angle

## From Screen to Substance

Using BIM Technology in Building

### **Get Ready for ICW 2015**

Southeast Asia's Premier  
Construction Event

### **Careers in Construction**

Become a Building  
Information Modelling  
Consultant

### **GST and the Industry**

Addressing Contractors'  
Concerns

# CONTENTS

## 02 Editor's Note

## 03 Global Frontiers

News and highlights from the construction sector around the world.

## 08 Events: Partnership for Safety

Sunway Construction and CIDB collaborate for industry safety at the launch of the Sunway Safety Week 2015.

## 10 Prime Movers

Building Information Modelling Consultant, Abi Sarwan Mazran Ibrahim, discusses the need and benefits of adopting BIM in Malaysia.

## 14 Main Feature: A Digital Revolution

**Heights** explores Building Information Modelling (BIM) technology which is changing the way the construction industry handles project management design and construction around the world.

## 20 Careers In Construction

Go behind the scenes as BIMASIA Managing Director and Co-Founder, Mohd Rizal Mohd Rosly explains what it takes to be a Building Information Modelling (BIM) Engineer.

## 24 Special Features: Industry Lighthouse

The world's construction industry experts and professionals will converge in Malaysia for the annual *International Construction Week 2015* in September, alongside *Ecobuild Southeast Asia*, *EcoLight Asia*, *Solar Asia Expo* and *Greenbuild Asia*.

## 28 Technology of Construction: On-Site Connection

The rapid growth of technology has penetrated every economic sector, with more efficient and effective methods of implementing development. In this issue of **Heights**, mobile devices keep industry professionals connected everywhere.

## 32 Money Matters: Making an Impact

An in-depth examination of the impact on the construction industry of the 6% Goods and Services Tax that became effective across Malaysia on the 1st of April.





## 36 Industry Trends:

In line with the technology theme of this issue, **Heights** travels around the world to highlight self-healing concrete, a brick-laying robot and affordable massive 3D buildings.

## 40 Going Global: An Indian Summer

What's attractive in the South Asian country for Malaysian construction companies? For starters, over the next 20 years, US\$650 billion (RM2.5 trillion) is expected to be pumped into enhancing the country's infrastructure.

## 44 Anniversary Special

Heights highlights some of the milestones and accomplishments of the CIDB as it marks its third anniversary.

# HEIGHTS

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# TIME FOR TECHNOLOGY

Heights shines the spotlight on Building Information Modelling (BIM) this issue, which allows contractors to complete their projects in less time and with greater efficiency.



On behalf of the Construction Industry Development Board of Malaysia (CIDB), we are pleased to welcome you to the inaugural issue of **Heights**. Our aim in publishing this magazine is manifold. We hope to enhance the Malaysian construction sector by highlighting the latest trends and international best practices, to attract students to a career in construction, and to showcase the latest initiatives by the CIDB in a handy and accessible medium.

All these targets are reflected in our theme for this issue which is the adoption of technology – particularly Building Information Modelling (BIM) – in construction. CIDB is especially keen to seeing more industry players adopt BIM, which is becoming the standard around the world, replacing the old-style two-dimensional blueprints and even three-dimensional AutoCAD with five-dimensional (length, width, depth, time and cost) scopes.

Our main feature this issue – *A Digital Revolution* on page 14 – highlights the benefits and opportunities that can be tapped through BIM, as well as the efforts being made to advance its adoption among Malaysian contractors. In addition, we also feature exclusive

interviews with BIM consultants and professionals, bringing the perspectives of experts to our readers.

As you will read inside, there are so many compelling reasons why BIM adoption is a must for any construction industry player that hopes to find success, not just locally but also beyond Malaysia. One fact that we'd share here is that, by conservative estimates, BIM reduces at least 2% of construction costs and 30% of total maintenance cost throughout the building's life cycle.

In this issue, we also shine the spotlight on the *International Construction Week 2015* (ICW 2015), which will be held at the Putra World Trade Centre (PWTC) from the 7th to the 11th of September. The largest construction sector event in Southeast Asia, we are expecting more than 15,000 trade visitors and 300 exhibitors. Take a sneak peek at what's in store in our special feature *Industry Lighthouse* on page 24.

All the above and the latest news and happenings, trends and technology from the world of construction are here. We hope you enjoy reading this first issue as much as we've enjoyed creating it for you.

# Gulf Growth



Source: dar.dargroup

## MIDDLE EAST

One of the massive construction projects in the region, the US\$3.5 billion Abraj Kudai – located in Saudi Arabia and scheduled to open in 2017 – will be the world's largest hotel. ▲

In its recently published *GCC Construction Industry Report 2015*, Middle East and Asia-based investment bank, Alpen Capital highlighted a number of challenges that Gulf Cooperation Council (GCC) nations face, even as the region is expected to see massive growth in the construction and infrastructure sectors between 2015 and 2018. Issues, such as the decline in global oil prices, high dependence on foreign workers, increased competition and higher costs of materials – particularly cement – owing to possible shortages, are some of the challenges highlighted.

On a positive note, Alpen Capital Qatar Managing Director Sanjay Bhatia, points out that despite these challenges, the GCC governments' focus on developing non-oil revenues has helped advance the construction

and infrastructure industries, with the value of projects planned and already being developed in the region estimated to reach US\$172 billion (RM651 billion) this year. From Saudi Arabia's investment in facilities to boost religious tourism to the UAE's infrastructural preparations for the FIFA Club World Cup 2017, GCC nations are going big on construction.

According to Bhatia, "Activity in sectors across infrastructure, residential, commercial, hospitality and retail have taken centre stage in inviting global participation and attracting the attention of businesses and tourists alike. Although investments are directly dependent on the pace of each government, we believe that the GCC region continues to be a desirable location with accelerating growth prospects for the near future."



# MALAYSIA



▲ Dato' Sri Ir Dr Judin Abdul Karim

## Facilitating Development

The Construction Industry Development Board of Malaysia (CIDB) and the British Institute of Facilities Management (BIFM) are sharing experiences and exchanging information, with the former hoping that the collaboration will enhance its expertise in the certification and development of

facilities management. According to CIDB CEO Datuk Seri Judin Abdul Karim, the collaboration will "include advisory services and recommendations on facilities management competent persons training scheme and organising/ facilitating events or programmes for communication and education.

The CIDB CEO noted that facilities management helps practitioners underline the importance maximising design and functionality by properly regulating facilities in the built environment. This partnership is indicative of the CIDB's drive to enhance the Malaysian construction sector, which is expected to enjoy a strong 2015. He said that the construction industry saw a 12.7% growth in 2014, with a total of 7,180 construction projects worth RM149 billion. He also revealed that between January and April this year, 1,147 projects worth RM20.32 billion have already been recorded.

Meanwhile, the Construction Industry Transformation Programme (CITP) framework – a masterplan to enhance professionalism in the industry – will be launched by Prime Minister Datuk Seri Najib Tun Razak in September 2015, at the upcoming *International Construction Week* in Kuala Lumpur. The CITP is also expected to help boost the construction industry's annual growth rate to 10% and increase the recognition of local contractors by independent international health and safety organisations.

# Sea City

Chinese construction firm CCCC-FHDI has commissioned London-based AT Design Office to plan a 6.44-square kilometre floating island as a measure to curtail urbanisation and overcrowding in China. Named 'Floating City', the self-sustaining neighbourhood will be part of a cluster of future townships, and features prefabricated, tessellated hexagonal modules, with sections above and below water level. Meanwhile, underwater tunnels will link all the cities, and the mainland.

Also to be housed underwater are a hotel and amusement park, as well as a traffic hub for submarines, cruise ships and ferries to transport residents between locations. In addition, the water-borne island will also feature essential necessities of a typical city – road networks (only for electric vehicles, to keep the city zero-carbon and energy efficient), a garbage recycling centre, a fish hatchery and vertical farms. Already, the China Transport Investment Company is reviewing the AT Design

Office proposal for a small-scale project beginning in 2016.

The Floating City is expected to be developed using similar technology the Asian giant has already implemented in creating its almost 50-kilometre bridge. The world's longest sea bridge, the construction spans from Hong Kong across Macau to Zhuhai, and is designed to withstand earthquakes of up to 8.0 magnitude, typhoons and the passage of up to 300,000 tonne cargo vessels.

## CHINA



Source: ATDesignOffice

▲ A rendering of the 6.44-square kilometre Floating Island that aims to help ease overcrowding in mainland China.



# Future City

On the 30th of June, the UAE's Minister of Cabinet Affairs and Chairman of UAE National Innovation Committee H.E. Mohammed Al Gergawi announced plans to commence construction of the world's first 3D printed office building in Dubai. The design of the 185.8-square metre structure, which will be constructed using a 1.86-metre tall 3D printer and assembled in weeks, is based on spaciousness and flexibility that allows for a wide range of uses and accommodation of team sizes.

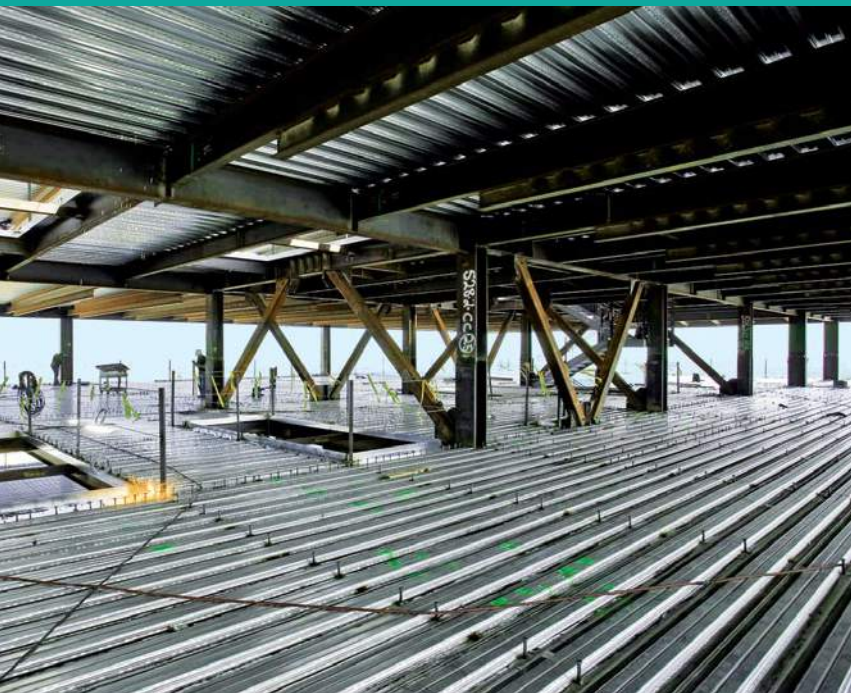
The structure is the first part of a larger initiative: Dubai's US\$136 million (RM509 million) 'Museum of the Future' project, a collaboration between China's 3D printing technology company WinSun, leading global architecture and engineering

firms – such as Gensler, Thornton Thomasetti, and Syska Hennessy – and international investors. The Museum of the Future will be sited near the city's financial district, and a 7-minute drive away from the Burj Khalifa skyscraper – which is currently the tallest man-made structure in the world.

According to Vice President and Prime Minister of the UAE, and Emir of Dubai, Sheikh Mohammed bin Rashid Al Maktoum, "The Museum of the Future will be an incubator for ideas and real designs, a driver for innovation and a global destination for inventors and entrepreneurs. The future belongs to those who can imagine it, design it, and execute it. Here in the UAE we think differently. While others try to predict the future, we create it."



## HONG KONG



Foundation construction using composite steel, which can be recycled and reused in the event of demolition. ▲

## Steel Strong

According to Chan Chi-fat, Construction Manager at Hong Kong's Gammon Construction – one of the country's largest contractors – a combination of composite steel and concrete, as opposed to using only the latter, will play a crucial role in the future of the country's construction industry. He explains that using composite steel in high-rise projects can help reduce the number of workers required on each floor, from 120 to 65, because different parts of the building can be prefabricated and transported to project sites, and installed with greater ease.

More than just making construction easier, utilising composite steel could help make completing projects 20% faster. Chan also noted that while the initial cost of the material was up to 24% more expensive than concrete (because it is produced in other countries, such as Japan and Korea, and transported to Hong Kong), composite steel is completely recyclable – which means that if a building gets demolished, the steel can be reused for another project.



## UNITED ARAB EMIRATES



Part of Dubai's 'Museum of the Future', the 185.8-square metre fully functional building will be the world's first 3D printed office. ▲

## Mark of Quality

The Royal Institution of Chartered Surveyors (RICS) recently launched its Inclusive Employer Quality Mark (IEQM) initiative to help diversify the workforce of firms in the nation's land, property and construction sector, and boost their competitive advantage through innovation. The IEQM allows companies to pledge their support to adopt the initiative as a commitment to improve six key principles: Development and Training, Flexible Working Arrangements, Inclusive Culture, Refresh and Renew Commitments to being a best Employer, and Sharing and Learning from Industry Best Practices.

After pledging their commitment, companies will be given access to data about their annual performance in the six core areas, compared to others in the industry. Signatories will also have access to case studies, ideas and support from other high-performing companies, and will be allowed to use a logo indicating that

they are 'signatory to the RICS Inclusive Employer Quality Mark'.

"This initiative has been discussed with, and has the support and encouragement of, a number of leading firms, both large and small, across the land and property sector. Employee needs are changing, along with their expectations and demographic make-up. The competitive war for talent has also shifted the focus to attracting and retaining talent in the industry. Only by doing so, can we deliver a sustainable future. By committing to the Quality Mark, firms will gain a competitive advantage. An inclusive approach allows organisations to reflect and engage with their clients more effectively and efficiently," revealed Louise Brooke-Smith, RICS President.

Louise Brooke-Smith ►



## UNITED KINGDOM

# Partnership for

# Safety

## CIDB AND SUNWAY CONSTRUCTION INK MEMORANDUM OF UNDERSTANDING



▲ Works Minister Dato' Sri Fadillah Yusof launches *Sunway Safety Week*. Pictured are (from left to right) Sunway Construction Group Senior Managing Director Kwan Foh Kwai, Sunway Group Chairman Tan Sri Jeffrey Cheah, Dato' Sri Fadillah, CIDB Chairman Tan Sri Dr Ahmad Tajuddin Ali, Sunway Construction Director Dato' Ir Johari Basri.

On the 1st of July, Works Minister Dato' Sri Fadillah Yusof, senior members of the Construction Industry Development Board (CIDB) of Malaysia, Sunway Construction and its sub-contractors, as well as other VIPs gathered at the Grand Ballroom of the Sunway Putra Hotel to witness the signing of a Memorandum of Understanding between CIDB and Sunway Construction. The MoU sees the latter become the first construction company in Malaysia to adopt the *Safety and Health Assessment System in Construction* (SHASSIC), which was introduced in 2008 and published as a Construction Industry Standard (CIS) that same year.





▲ Sunway Construction Group Senior Managing Director Kwan Foh Kwai signing the MoU witnessed by Sunway Construction Director Dato' Ir Johari Basri, Sunway Group Chairman Tan Sri Jeffrey Cheah and Works Minister Dato' Sri Fadillah Yusof.

As the body entrusted with spearheading the development of the Malaysian construction industry, CIDB has initiated a number of programmes aimed at enhancing the sector, and SHASSIC is one of them. Its objectives are to benchmark safety and health in the Malaysian construction sector, as well as to have a standard system assessment and evaluation of both construction sites and contractors.

The event also marked the launch of the *Sunway Safety*

*Week 2015* themed *Partnering Towards ESH (Environmental, Safety and Health) Excellence*, which was officiated by Dato' Sri Fadillah, who congratulated Sunway Construction for its commitment to safety.

The Works Minister also announced the implementation of the Construction Industry Transformation Programme (CITP) in September, which will introduce "strategies and initiatives to transform the industry in terms of quality, safety, sustainability and productivity."

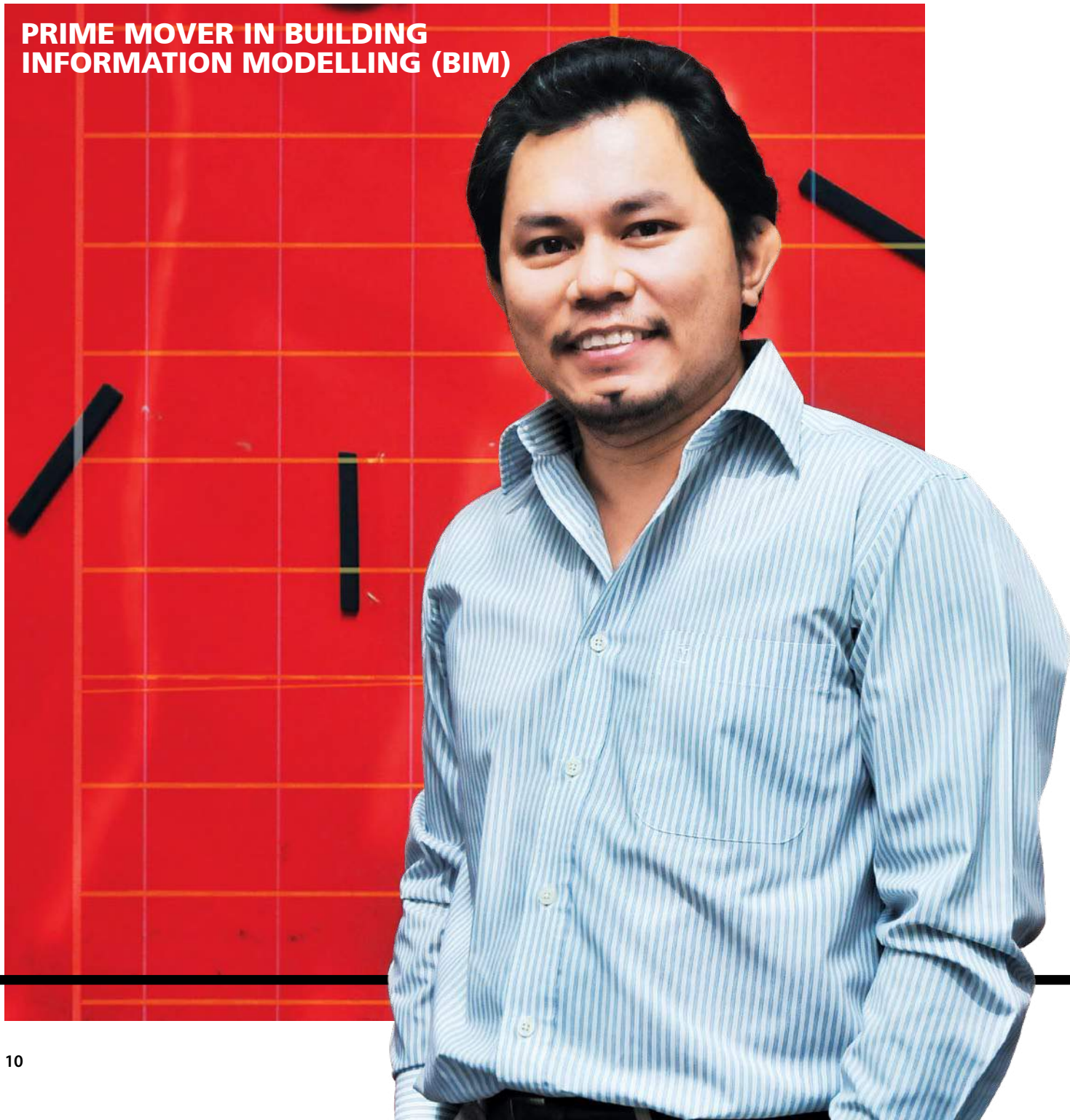
▼ VIPs take the Safety Pledge and give out the Safety Cheer.



Dato' Sri Fadillah then officially launched *Sunway Safety Week 2015*, followed by the signing of the MoU by CIDB CEO Dato' Sri Ir Dr Judin Abdul Karim and Sunway Construction Group Senior Managing Director Kwan Foh Kwai. All present were then led in a Safety Pledge and Cheer – where participants committed themselves to upholding principles of safety, which were also performed by members of Sunway Construction at its various worksites, and broadcasted via live-feed.

# Abi Sarwan Mazran Ibrahim

**PRIME MOVER IN BUILDING  
INFORMATION MODELLING (BIM)**





An architect by training, Abi Sarwan Mazran Ibrahim is the founder and Managing Director of a Building Information Modelling (BIM) sales and consulting company, providing interested parties with the software, training and expertise to incorporate BIM into their projects. Having been involved with BIM since 2004, he has contributed his expertise to the steering committee set up by the Construction Industry Development Board of Malaysia (CIDB) to explore the implementation of BIM. In addition, he has also conducted workshops on the matter. It is owing to this experience that **Heights** approached Abi Sarwan to be featured as a **Prime Mover** in BIM, where he speaks on the trends in the sector.

According to a survey carried out by the CIDB, only 5% of construction firms in Malaysia utilise BIM. Why do you think that is the case and what can be done to improve this figure?

"I think the first thing that needs to be understood is that there are different categories and sizes of contractors. So when you talk about the 5%, it represents the total number of contractors out there. At this moment, the ones that are really adopting and utilising BIM are the really big construction firms. Now, when compared against all the players in the

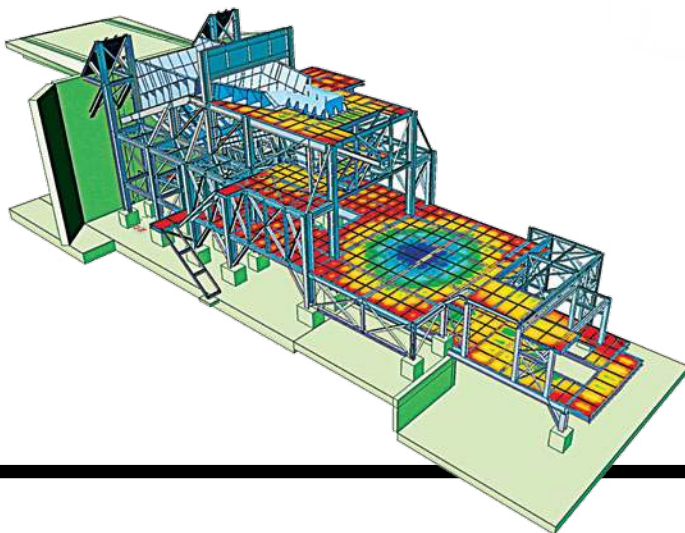
industry, this number is small. However, when we look at the size and value of their projects, their impact on the industry is definitely above 5%.

So, why aren't more players in construction taking up BIM? I think there are several factors behind it. For example, from the subcontractors' side, there are very

few compelling reasons for them to use BIM, because only a few main contractors are pushing for it.

While there are smaller contractors, sub-contractors and consultants getting interested in BIM because they want to have a differentiator, many adopt a 'wait-and-see' approach. This is because in Malaysia, we are used to a top-down push when it comes to introducing changes. For example, one of our clients is a major construction firm that has embraced BIM and made it compulsory for their consultants and subcontractors to work with the BIM information.

Overall, cost is a major stumbling block. For many contractors and subcontractors, it is not that they don't see the value of BIM, but at the moment, the costs outweigh the benefits."



## What are the most compelling benefits of utilising BIM for construction industry players?

"This differs according to role and from organisation to organisation. For instance, stakeholders and owners will want to utilise BIM because it allows them to have better control over the project.

In Malaysia, the trend is to build upwards and to build bigger. So buildings are becoming more complex, and there are more specialists and people getting involved. Therefore, project owners start looking for more efficient methods to manage the projects, in addition to having surety of what they are investing in. They can achieve this with BIM.

In March, I gave a talk at PR1MA (the agency entrusted with building affordable houses in Malaysia), where I was the only local consultant to share our experience in BIM to mechanical, electrical and plumbing engineers and contractors.

PR1MA is exploring better methods of constructing buildings. They have been tasked with building RM500,000 worth of houses every year, so they are looking at improving efficiency, and BIM is one of the solutions they are looking at.

In addition, BIM can help with the problem of abandoned construction projects, especially if the reason for abandonment is a lack of finance. This is because BIM allows greater visibility on the complexity of a project and how much it will cost. So better planning can be executed earlier.

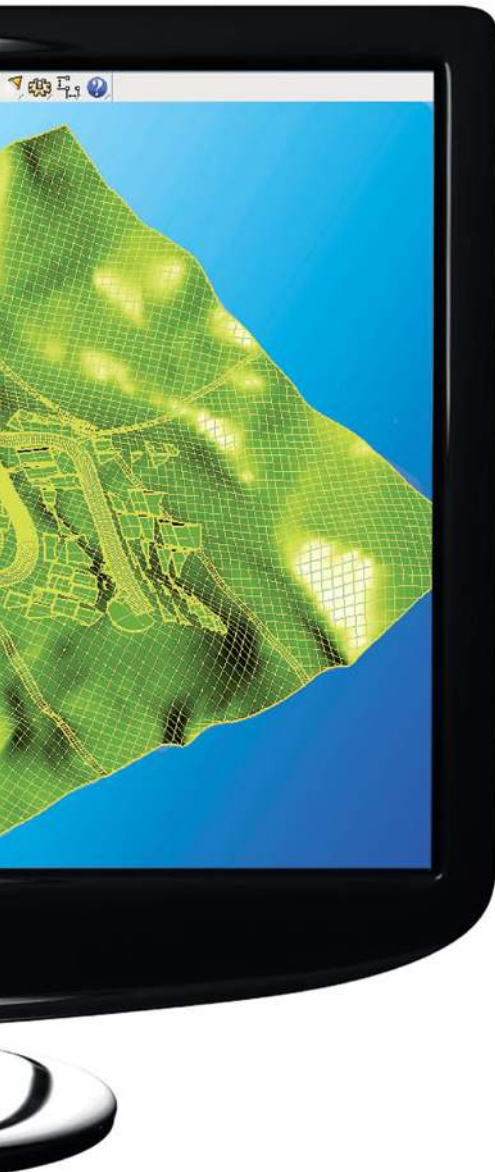
As for consultants, the main reason is to become more competitive, which is driven in part by the liberalisation of the service sector. Because of this, excellent consultants from abroad can come and practice in Malaysia, and they have BIM expertise which gives them an advantage. So in order to stay in the game, local consultants should start considering at BIM."







As a BIM consultant, Abi Sarwan has helped out in several construction projects and believes that the use of BIM by the big names in Malaysian construction will help spur its take-up. ▲



◀ Aside from being used to design buildings, BIM can also be utilised to measure the topography of land, helping developers better plan the location of their projects.

## In your opinion, what are the major trends in construction and BIM?

“When we talk about BIM, it involves two very different industries which are IT and construction. Whereas IT is dynamic, the construction sector is very traditional. For instance, in construction, things are done very much according to the rule of thumb, meaning that if it worked before, it will work again. By adopting BIM, construction firms can break some of those traditions and enable better coordination.

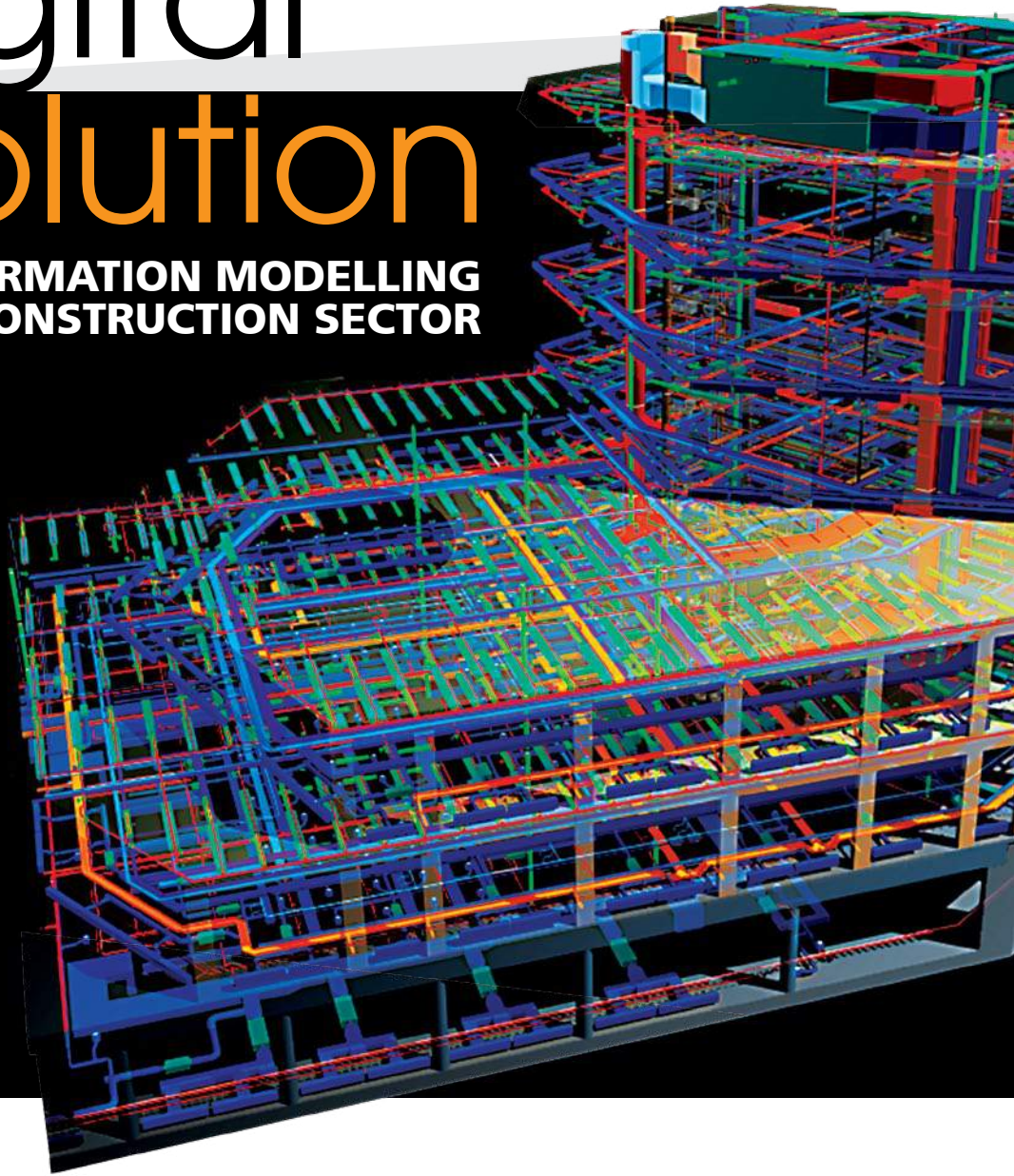
In addition, with the Internet of Things, the sharing of information among the different parties involved in a project will also change. Traditionally, the usual methods are either through print, email or DVDs; now more people are using the Cloud, thus enabling real time access to data.

At the same time, construction is changing because the process will not be as linear as before. In the past, we could define different stages but now there are so many overlaps and things have to be done simultaneously, so BIM is needed to handle that complexity.”

Undoubtedly, the adoption of Building Information Modelling will bring about many advantages for the construction industry and its stakeholders, enabling better management of costs and complexity. The challenge now is to encourage its adoption by the bulk of the sector, although – as Abi Sarwan Mazran Ibrahim pointed out – it is already being embraced by the more established names in the game. For the other players however, it is important they realise that BIM is no longer a luxury but a necessity for survival and success. ■

# A Digital Revolution

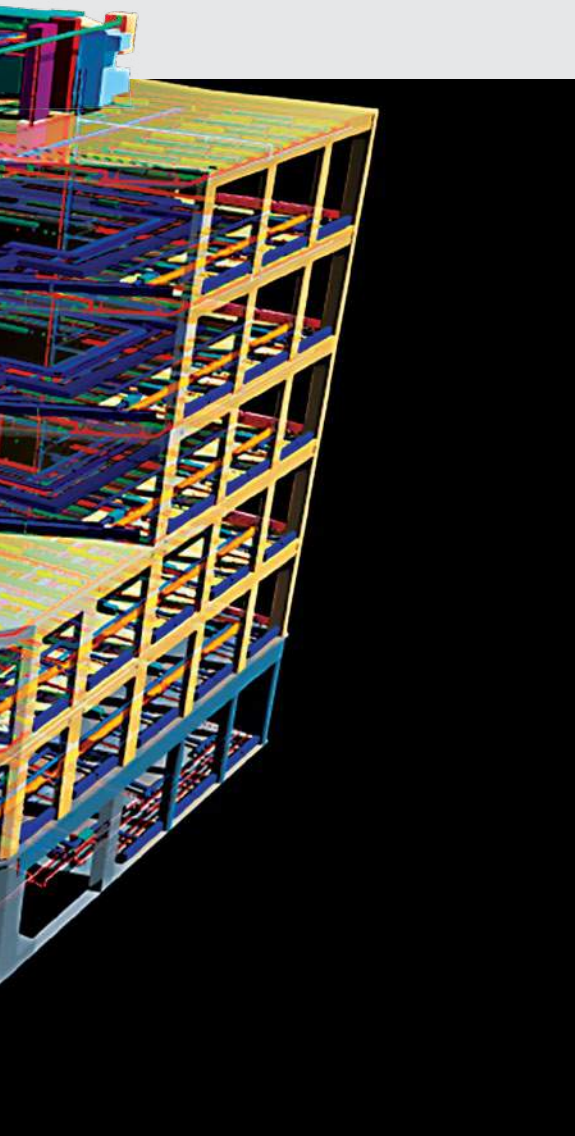
**BUILDING INFORMATION MODELLING  
ENHANCES THE CONSTRUCTION SECTOR**



Undoubtedly one of the biggest breakthroughs in building design and construction, Building Information Modelling (BIM) has revolutionised the industry. Defined by the US National Building Information Model Project Committee as “a digital representation of physical and functional characteristics of a facility”, BIM has allowed architects, contractors and sub-contractors to eliminate the cumbersome, and sometimes inaccurate, two-dimensional technical drawings, replacing them with five-dimensional (width, depth and length plus time and costs) scaled models that enable work to be carried out more quickly and efficiently.



Through Building Information Modelling (BIM), those involved in the design and construction process of a structure can utilise 5-dimensional digital models which ensure more precise planning while minimising wastage of paper and time.



One example of BIM at work as highlighted by business periodical *Fast Company* is the Collaborative Life Sciences Building (CLSB) in Oregon, USA. Measuring 650,000 sq ft, the project saw the involvement of 28 different design teams, as well as contractors and sub-contractors.

More often than not, having that many stakeholders may cause problems as different teams work on separate yet interconnected aspects of the building, which may lead to conflict and complications. These potential issues were avoided owing to BIM software, and the building was completed in 2014, with the final cost being US\$10 million (RM37.65 million) lower than expected.

Speaking to BIM news website *BIM Crunch*, Alene Davis, Associate Principal at SERA Architects – one of the lead entities in the design of the CLSB – said, “The use of an all-digital design and documentation process

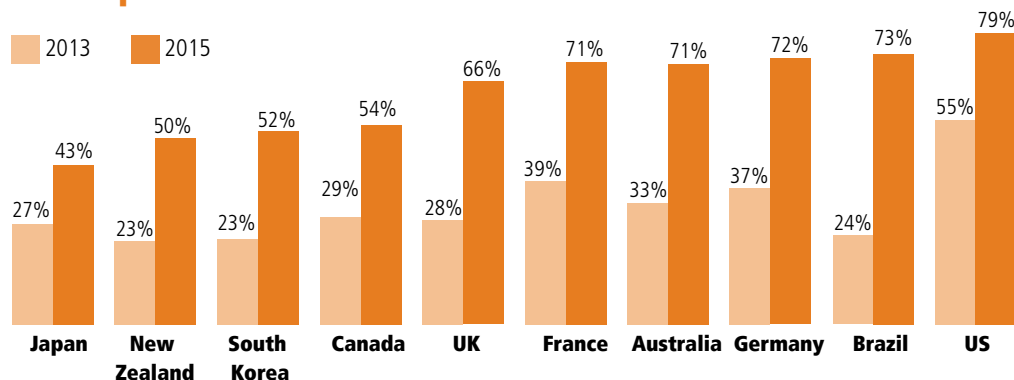
sped up both coordination and construction. It’s hard to determine just how much more time the project would have taken if these processes hadn’t been as streamlined, but it’s safe to say we saved many months.”

## Virtual Advantages

Aside from the cost factor, there are a number of other reasons why the design and construction industries should embrace BIM. For one thing, it enables cost-free experimentation as contractors can use modelling software to simulate the best way to approach a task without having to do so in real life.

There are a myriad of BIM programmes catering to the various aspects of design and construction. These range from those designed to help architects plan the model of the building, such as *Bentley Architecture*, to those that enable contractors simulate construction and calculate costs, such as *Vico Office Suite*.

## Percentage of contractors at high/very high BIM implementation levels

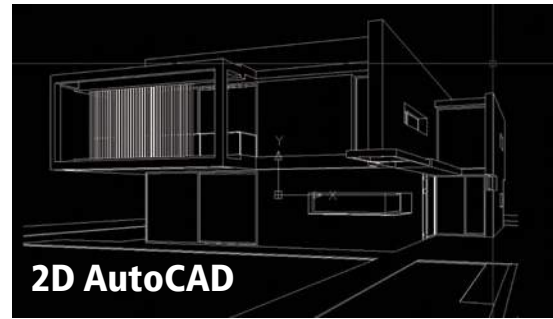
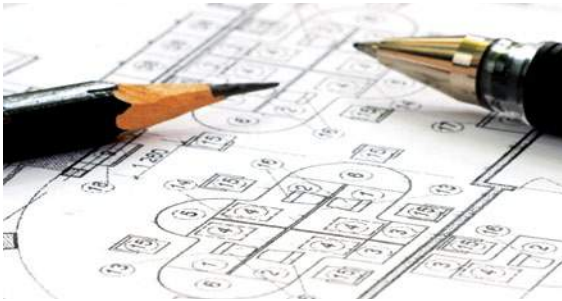


Source: McGraw Hill Construction, 2013

◀ In a 2013 study, McGraw Hill Construction expected BIM take-up to rapidly expand over the next two years, particularly in advanced nations, which is indicative of the growth of digital technology in the construction sector.

## The Evolution of BIM

### 1D Pencil Drawing



### 3D BIM

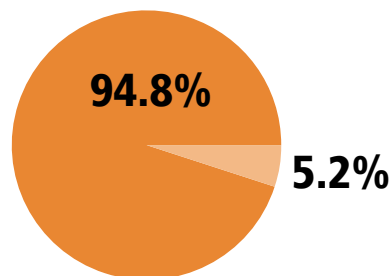


Furthermore, thanks to the advent of mobile technology, a number of these programmes can be used on mobile devices such as smartphones and tablets. As highlighted in *On-Site Connection* on page 28, this has enabled involved parties to instantly access data while on-site to ensure that what is being done is in line with the plans.

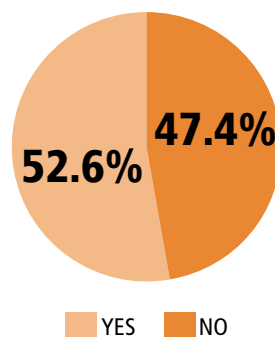
Also, in a commentary published on *The Star Online*, Michael Gustafson – professional engineer industry strategy manager for structural engineering at architecture and software firm Autodesk – noted that “leading engineering firms are finding that BIM provides opportunities for companies to reshape projects at an ecosystem level, changing workflows in ways that deliver results.”

Gustafson also highlighted a McGraw Hill Construction SmartMarket Report from 2013 which stated, “adoption of BIM has reached more than 70% among firms in North America”,

### Percentage of BIM adoption among Malaysian Contractors



### Awareness of BIM among Malaysian Contractor





A study carried out by CIDB shows that while more than half of Malaysian contractors know of BIM, only slightly more than 5% utilise it – a gap which the construction sector regulator aims to narrow.

Deputy Minister of Works Datuk Rosnah Abdul Rashid Shirlin, flanked by CIDB CEO Datuk Seri Ir Dr Judin Abd Karim (on her left) and CIDB Senior General Manager, Technology Development Sector Ir Elias Ismail, inspects a presentation on BIM at International Construction Week 2014.



evidence of the increased popularity of BIM in the industry. This boom however has yet to take place in Malaysia, and the Construction Industry Development Board of Malaysia (CIDB) aims to change this.

### The Malaysian Journey

To do so, CIDB has organised several workshops on this matter. On the 19th of June 2013, it held *Issues and Challenges in Implementing Building Information Modelling (BIM) by SME's in the Construction Industry*, at the Holiday Inn Kuala Lumpur. Then on the 25th of February 2014, it hosted a workshop on *Contractor's Acceptance of Building Information Modelling (BIM) Towards Improvement of Project Performance and Profitability*, at Cyberview Lodge Resort and Spa in Cyberjaya.

A number of key findings were highlighted in the sessions. For instance, from 2007 to 2013, use of BIM increased from 28% to 71% in the construction industry worldwide, with the number of contractors utilising it growing from 50% to 74% between 2009 and 2012. However, the growth in Malaysia has been rather stunted, as only 5.2% of construction firms have adopted the technology.

In terms of awareness, around 52.6% of contractors in the country are aware of BIM. Therefore, the low take-up cannot be entirely attributed to ignorance. However, it was concluded that a lack of knowledge of the benefits of BIM has contributed to its low adoption among Malaysian construction industry players. That being said, most of those who had already applied BIM into their operational processes agree that it has

enabled them to have better design and production quality as well as improve their efficiency.

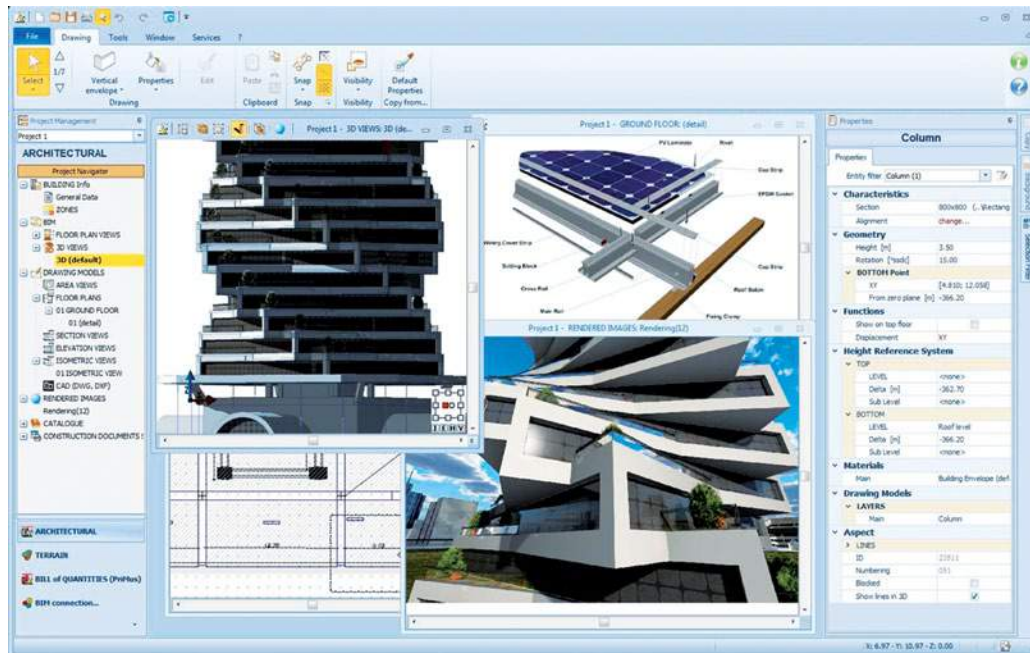
Unsurprisingly, cost is a major obstacle towards BIM adoption, particularly the time and price of BIM training. The worry among contractors is that, not only will they have to foot the bill for the training (and lose the services of their staff during that time), but there is also no guarantee that the employee will not use that new-found knowledge to price himself out of their reach and seek employment at a rival firm.

Also, there is a problem with the time of implementation. As was pointed out in the second workshop, full and proper implementation of the BIM process can take 2 to 3 months after completion of training, and workflow will have to be adjusted accordingly. This in turn may increase complexity leading to time lost on project delivery.

Another stumbling block is the cost of technology. Not only does BIM software require high-performing hardware, thus requiring companies to spend for an upgrade in both areas, the price of the software could also be prohibitive. Part of the reason for this is because all BIM software is proprietary to companies outside Malaysia, and as such, the costs and licence fees are converted from stronger currencies to the ringgit.

## Addressing Concerns

In the face of this, the CIDB has been looking at ways facilitate the adoption of BIM among Malaysian contractors. One notable person in this initiative, Mohd Harris Ismail, is the Construction IT Senior Manager of CIDB, and also the acknowledged expert in BIM. A key speaker in the



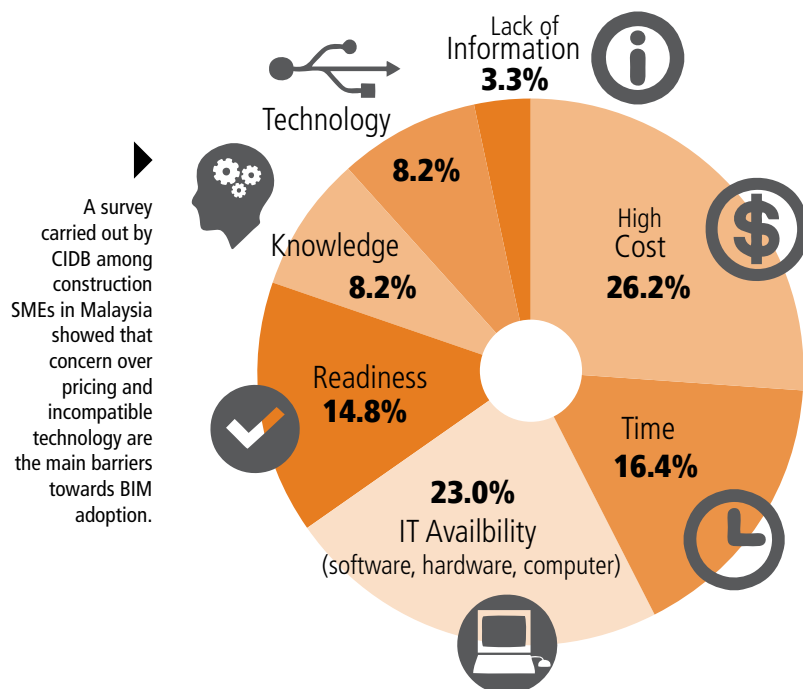
▲ A screenshot of a BIM programme by ACCA Software showing how 1D, 2D and 3D elements can be combined together to help project managers have a better view of their projects.



▲ Located in Oregon, USA, the Collaborative Life Sciences Building (CLSB) was designed and constructed with the help of BIM, which shaved US\$10 million its final cost.



## Barriers to implementing BIM



application, and cause licence fees to be charged in ringgit rather than in foreign currencies such as the US dollar, which has risen substantially in value over the past year."

Another initiative is the setting up of a BIM lab, which is expected to be opened by the end of the year. Here, contractors can pay to use BIM applications on a software-as-a-service basis, allowing them to utilise the technology without having to own it, which will be very useful for smaller contractors.

As noted, another barrier to entry includes the lack of expertise. Harris explained that, to tackle this, CIDB is planning to introduce BIM as a subject in the six *Akademi Binaan Malaysia* (Malaysian Construction Academies) it runs throughout the country. "This will effectively ensure that professionals in local construction have the requisite knowledge to manage the technology," he concluded.

Furthermore, there have been roadshows organised to show construction companies the benefits of utilising BIM, with the National BIM Day planned for in September this year, where industry experts from overseas have been invited to talk about BIM to local industry players.

two aforementioned workshops, Harris revealed to *Heights* a few of the initiatives currently being considered.

For instance, in order to reduce the price point and make BIM technology more affordable to Malaysian contractors, investment in research and development has been proposed. This, he said, will result in "the local development of such software and

Building Information Modelling is becoming a necessity in the construction industry, and it is imperative that those involved in the sector in Malaysia embrace it sooner rather than later. Doing so will not only enhance their capabilities, but also enable them to more effectively bid for overseas construction projects. This is because as BIM becomes the norm in the industry worldwide, Malaysian companies will need to meet such requirements. ■



# SO YOU WANT TO BE... A BIM CONSULTANT



In our bid to encourage more interest in the construction sector among students, **Heights** showcases professionals in various fields related to the construction industry – from architects to engineers, from project managers to site inspectors. Taking readers behind the scenes to find out more about what working in such a field entails, we start off the first Careers in Construction section by speaking with **Mohd Rizal Mohd Rosly**, a **Building Information Modelling (BIM) Consultant**.

The co-founder and Managing Director of his own BIM consulting firm, Rizal was previously an architect in a major Malaysian property developer and then later a BIM manager in the Malaysian office of a UK-based architecture firm.

An architecture graduate from Universiti Teknologi Malaysia (UTM) in Skudai, Johor, Rizal was first exposed to BIM at the early age of nine when he saw his uncle (who is also an architect) using a computer programme to design a building. Recalling that incident, Rizal said, “It was just like playing a game, and that got me interested.”

Years later when he enrolled in university, he found that the way things were done in UTM did not match his childhood memories. For one thing, drawings were still being done in 2D



BIM Consultant Mohd Rizal Mohd Rosly believes that BIM take-up in Malaysia is on the rise and is confident of its future in Malaysian construction



on blueprint paper. After talking with his uncle, Rizal decided to learn BIM on his own, and his decision paid off in his final year when, by using BIM tools, he finished his project earlier than others.

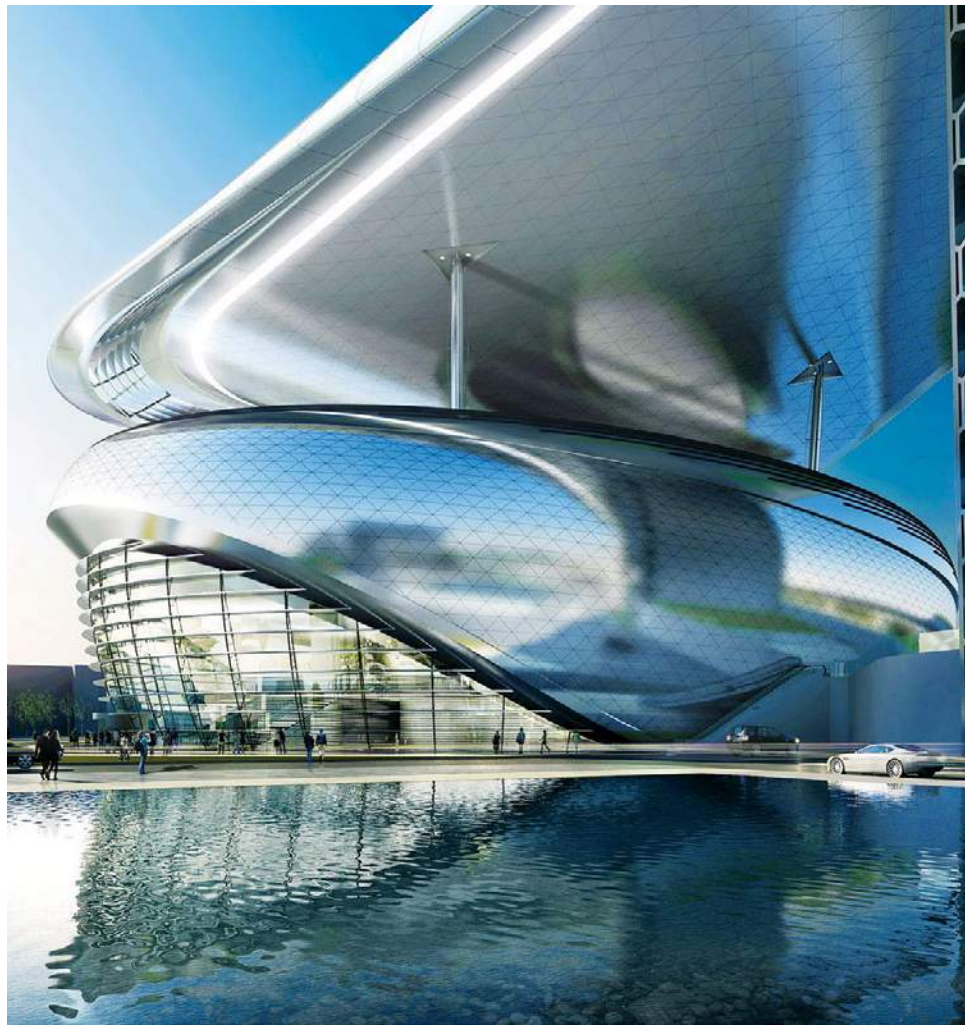
## Why BIM?

According to Rizal, knowledge of construction is a must when using BIM. As he told *Heights*, "BIM can ease the process of designing and managing the project, but first you need to know how to build the buildings first. People often make the mistake of saying that BIM is a software. It is not. It is a methodology of using a 3D model as medium to authorise, manage and extract data throughout the project lifecycle."

In a nutshell, BIM is a time-saver and cost-saver too, as it allows those involved in the architecture, construction and engineering (ACE) field to identify problems even before construction begins. Citing a previous project as an example, Rizal highlighted how BIM enabled his team to see that the plans for a carpark ramp was unviable and to make the changes accordingly.

Since its formation in 2013, Rizal's company has been involved in a number of projects for both the government and private developers. The biggest one is undoubtedly the Asia Aerospace City in Subang. Part of the Economic Transformation Programme (ETP), the Asia Aerospace City is planned as a hub for the global aerospace and aviation engineering cluster.

Explaining his company's role in the project, Rizal revealed, "We are the lead BIM consultant and are



Mohd Rizal is involved in the Asia Aerospace City in Subang, a hub for the global aerospace and aviation engineering cluster.

"To be a BIM consultant, you need a background or knowledge in construction and most importantly, you need to have passion."

Among the various projects for which Mohd Rizal has acted or is acting as a BIM consultant are (from top to bottom) Section U1, Shah Alam, Selangor, PJ Sentral Garden City Phase 1, Selangor and Jalan Kemajuan, Subang, Selangor

implementing BIM throughout the process, establishing the standards and educating the staff about BIM."

Rizal and his team are not just involved in mega-projects however. Demonstrating the suitability of BIM for all aspects of construction and design, they have been involved in the building of new houses for people who lost theirs in the December 2014 floods in Kelantan. Thanks to BIM, the cost of each house was slashed from RM65,000 to RM45,000, enabling more homes to be built. These were recently launched before Hari Raya Aidilfitri this year.

## Creating Awareness

Education is a key part of what Rizal does. As BIM is still in its infancy in Malaysia, enlightening potential clients about its benefits is usually one of the first things he does. As he said, "I don't want them (the client) to embark on something that they are not sure about or they don't know."

There are several advantages to BIM that he highlights. For instance, it enables people to see a 3D-render of the finished building complete with little details such as the wiring and piping. "As they are not architects, our clients usually have

trouble envisioning the finished building from the blueprints. But with BIM, they can see how everything is supposed to look," Rizal noted.

Another highlight of BIM is that it helps those involved in the project see progress from a 4D perspective (length, width, depth and time). Through this, the team responsible can monitor the project's progress, taking note of whether or not the actual physical construction is in tandem with the set timelines.

Perhaps Rizal's most compelling argument comes from a dollars and cents angle, "Just by adopting BIM, you can reduce construction cost by 2%," he revealed. "This is a conservative figure. If you use BIM extensively, it can go up to 5% and throughout the lifecycle it can go up to 30%, especially when BIM is used in maintenance."

## Positive Outlook

Normally, when a BIM consultant is called in, the architect may become suspicious as it could be seen as a negative judgement on his capability. That is why one recurring task on Rizal's plate is to convince the others on the project team that he is not there to undermine them or to show them up, but to support them.

All in all, Mohd Rizal Mohd Rosly is quite commending of the Construction Industry Development Board of Malaysia's (CIBD's) initiatives to increase BIM awareness, noting that the regulator is "getting contractors to know that BIM is something that can change the industry, make the industry more efficient and proper in terms of costing and management." ■







## A DAY IN THE LIFE

### What is the work of a BIM consultant like on a daily basis?

"In BIM, you have three different roles – manager, coordinator and modeller. As a BIM manager, I need to plan for my coordinator to do their work. I study the timeline and the man hours, go through the proposals, meet clients and come up with strategy. I am also involved in the CIDB's national BIM guide committee.

Coordinators need to supervise the modellers and make sure that they are doing things correctly, as well as execute the BIM plan. And finally, the modeller's job is to do the modelling and key in the information to the model. So the coordinator needs to make sure that the information being keyed in by the modeller is correct, otherwise it will cause serious problems."

### What are the usual challenges you face and how do you overcome them?

"My challenges everyday are people, technology, policy and process. I try to convince potential clients why they need BIM, especially when they say they don't need it because they have been in construction for decades. So, I ask them, 'Ok, you managed to complete the project. But, how many variation orders did you have? How sure was your architect that everything was going according to plan?'

When it comes to technology, people claim that BIM is expensive and it is only for big projects. So I need to tell them that if you know how to use it properly, it is not that expensive.

Policy is another obstacle. In Malaysia, the 2D hardcopy blueprints are still needed for legal records just in case anything happens. And making copies is expensive. So the ideal is to make BIM models legally admissible before the court or the tribunal.

And last but not least, process. At the moment, it is a very linear system where one process needs to be completed before moving to the next. This is not how it works in BIM, which allows for more flexibility and more things to be done at the same time."

### What professional and personal traits does a BIM consultant need to possess?

"To be a BIM consultant, you need a background or knowledge in construction.

As for personality trait, you need to be interested in 3D modelling and talking with people, because communication is important in BIM. And most importantly, you need to have passion."

### Using a ballpark figure, what is the average starting salary for a BIM professional?

"Usually you start off as a BIM modeller, so the starting salary is around RM3,000 to RM3,500. This is because it is a graduate position. As for coordinators, they can get around RM4,500 and above."

# Industry Lighthouse

**ILLUMINATING THE WAY FOR THE CONSTRUCTION SECTOR**



▲ Second from the left to right: CIDB Chairman Tan Sri Dr Ahmad Tajuddin Ali, Works Minister Dato' Sri Fadillah Yusof, CIDB CEO Datuk Seri Ir Dr Judin Abdul Karim, UBM Asia (Thailand, Malaysia, Indonesia, Vietnam & Philippines) Managing Director Muthiah Gandhi and then Director-General of the Public Works Department Dato' Ir Anniess Md Ariff at the ribbon-cutting ceremony launching ICW 2014.

From the 7th to 11th of September, the Construction Industry Development Board (CIDB) will host the *International Construction Week (ICW) 2015* at the Putra World Trade Centre (PWTC) in Kuala Lumpur. Southeast Asia's largest construction event, the five-day gathering will bring together construction industry professionals and players from the region and around the world.



First introduced in 1998 as the *National Construction Week*, it was renamed ICW in 2004 to reflect the event's and industry's growing influence, and to attract participation of more international players and projects to the country. As Malaysia's construction sector expands, the event has brought together corporations, industry experts, policymakers, students and visitors from around the world to exchange knowledge and learn the latest trends in the construction of national, regional and international buildings and infrastructure in a sustainable manner.

The ICW 2015 is expected to welcome more than 15,000 visitors and participants to the exhibition, as well as the various conferences and seminars organised during the week. UBM, the organising partner for ICW 2015, aims to secure 300 exhibitors and more than 10,000 trade visitors at the exhibition component of ICW 2015, *Ecobuild Southeast Asia*, which will run from the 9th to 11 September 2015.

▼ Then Director-General of the Public Works Department Malaysia, Dato' Ir Annies Md Ariff (first row, second from the right) at the International Construction Week 2014.



▲ The *International Construction Week* provides a platform for industry leaders, policymakers, exhibitors, service providers and trade visitors to converge under one roof to network, discuss and share information on the latest trends and developments, as well as showcase the construction and building industry's cutting-edge products and services.

Apart from industry showcases of construction products and technologies, *Ecobuild* offers 65 free-to-attend business seminars and workshops.

The ICW 2015 is scheduled to be officiated by the Prime Minister Dato' Sri Najib Tun Razak, who will also reveal the Construction Industry Transformation Plan (CITP).

## Focus on Sustainability

This year, ICW 2015 carries the theme "Building a Greener Future" to signify the importance of sustainability in the construction industry. *Ecobuild Southeast Asia*, which is in its third iteration, is the anchor exhibition component of ICW 2015. *Ecobuild* is one of the world's largest trade events that caters to sustainable design, construction and performance of the built environment, and regularly attracts the biggest companies in sustainable construction and development.

Sustainability is particularly important in Southeast Asia as it is one of the regions currently seeing the fastest economic and infrastructural growth in the world. One side-effect of this growth is significant environmental degradation, even as governments try to implement measures to enhance sustainability and encourage the use of renewable resources.

For instance, in 2010, the Malaysian government introduced the Green Technology Financing Scheme that provides a 2% subsidy on soft loans and 60% financing for Green technology-based projects. It is to drive these initiatives further that *Greenbuild Asia*, running alongside *Ecobuild Southeast Asia*, provides a platform for governments and decision-makers to meet, discuss and formulate policies that help promote Green agendas in countries across Asia.

The ICW 2015 will run simultaneously with the Engineering Week 2015 and will feature significant industry events such as the *First ASEAN Construction Summit*, *Women Construction Entrepreneurs Convention*, *Institution of Fire Engineers Conference*, *Construction Contract Management Conference for the Built Environment* and the *Second AWAM International Conference in Civil Engineering 2015*, among others.

One of the core highlights of ICW 2015 is the *AWAM International Conference on Civil Engineering 2015*. Held from the 9th to 11th and organised by the Universiti Sains Malaysia's School of Civil Engineering, it has been themed *Propelling the Nation's Competitiveness through Sustainable Infrastructure*.

The conference aims to expand on and gain insight into the challenges and opportunities of sustainable development from experts in the field. These include professionals

At the Open Ideas Competition 2014, the first prize went to a student from Universiti Teknologi Malaysia, seen here accepting it from Ir Ahmad 'Asri Abd Hamid, Senior General Manager of CIDB Malaysia.



Works Minister Datuk Fadillah Yusof and other VIPs visited the booths, one of them the Aibotix Malaysia Sdn Bhd booth where their new product, the Aibot-X6 drone, was displayed.







More than 13,000 professional visitors from 24 countries attended ICW 2014.

CIDB Malaysia's Pavillion Booth



from organisations such as Malaysian Airports Holdings, public transportation firms Prasarana Malaysia and MASS Rapid Transit Corporation, as well as real estate developers Iskandar Regional Development Authority and UEM Sunrise.

Industry and trade visitors will also be able to attend open-entry seminars covering crucial construction and

building industry subjects over the three days of the Ecobuild Southeast Asia, namely: *Gen Y and the construction Industry*, *Water Security: Current and Future Water Supply in Malaysia* to *BIM (Building Information Modelling) Adoption in Malaysia – Ready or Not, Here We Go!* These topics are particularly essential for the fast-growing construction industry in Malaysia.

To cater for the development of future industry talents, the ICW 2015 will also feature a Career Fair, Highest Early Strength Concrete Cube Competition (HESCCC) and the Open Ideas Competition. The event closes on the evening of the 11th of September with the Malaysian Construction Industry Excellence Awards, which will recognise the best of the best in the construction industry. ■

# ON-SITE CONNECTION

## Mobile Devices in Construction

**W**hen US construction firm Boldt was named the lead contractor of the Anderson Lucchetti Women's and Children's Centre in Sacramento, California, it found itself confronted by the challenges that come with juggling a project of significant magnitude. Costing US\$750 million (RM2.8 billions), the 242-bed, 10-storey, 395,000 sq ft medical centre is one of the largest on the west coast of the United States. By utilising a mobile application known as *PlanGrid* – developed by a California-based company of the same name – Boldt was able to streamline the updating and sharing of blueprints and technical drawings with all concerned parties. The result – more effective communication, less time lost and better coordination, which led to lowered cost of construction.

Whereas ICT has become an integral part of off-site processes, such as the drawing of building plans, blueprints and modelling, digital technology has yet to truly penetrate into the actual construction work site. That, however, is changing, as can be seen in *PlanGrid* as well as a number of other mobile apps that have been created for the construction industry.

Perhaps the strongest pull-factor for the utilisation of ICT on-site is that it improves efficiency and productivity while cutting down on costs and

human error. For example, *Fast Company* estimates that approximately US\$4 billion is spent each year on blueprints by the construction industry in the United States alone. Compounding the problem is the high cost of printing – averaging US\$23,000 (RM86,000) for a fully-bound set – and each time an update is made, a new set has to be printed.

Such a financially-painful experience was the catalyst which inspired *PlanGrid*'s co-founder Tracy Young to look for an alternative to the status

quo. In 2010, as a project engineer, she decided to order a set of blueprints for the members of her team so that each could make annotations on their own copy. It burnt a hole in her pocket as printing costs set her back US\$27,000 (RM100,000).

### Application of Mobile Technology

Mobile applications for the construction industry vary in size and scope. For instance, one common challenge faced by construction companies is the need for a smooth flow of information between various project sites and the central office.

One application which has been developed for this is *Construction Manager* by Snappii, which allows for real-time transfer of information such as project estimates, work logs, and time sheets from the worksite to the management office. This in turn helps the back office come up with more accurate costing and budgeting estimates, saving money and resources.

When it comes to mobile software for construction project management, contractors are seemingly spoiled for choice, and among the more popular apps today are *UDA ConstructionSuite*, *BuilderTREND*, and *ProContractorMX*. While the bells and whistles of each







- ▲ The increased use of mobile technology in construction has resulted in devices such as smartphones and tablets becoming commonplace on work sites, as they allow users to obtain and share real-time information at the touch of a screen.



## Mobile Technology in Malaysian Construction



While mobile solutions are becoming increasingly common in construction sites in more developed economies, take-up in Malaysia still has some way to go. The CIDB is working to close that gap and hopes to encourage more firms to utilise this technology in their operations. Before this can be done, certain obstacles need to be overcome, as **CIDB's Construction IT Senior Manager – Mohd Harris Ismail** – explained to **Heights**.

Aside from being Senior IT Manager, Harris Ismail is also an expert on Building Information Modelling (BIM). The process of creating, generating and using 3D digital representations of buildings in the construction process (more on this on page 12), BIM is an extremely useful tool which saves money and time.

When used in a mobile device, the utility of BIM software is further enhanced. For example, one such application for the Apple iPhone and iPad – Bentley Navigator – is used to review and analyse project information, and allows 3D interactive models and data to be stored and shared with other users.

Demonstrating the application at work on his iPad, Harris explained that relevant parties can access the 3D building model. "With this, they can check the information against the work-in-





progress to make sure that what has been done is in line with what is planned," he explained. "Another benefit is that all parties will have access to the same information and models as the contractor and architect, thus reducing requests for information (RFI), which can be quite expensive."

He also highlighted that one of the main barriers to the uptake of such technology is cost. "One licence might set a company back RM20,000 and the annual renewal fee could be as much as RM4,000. Once you include the cost of buying a licence for each device and for training, it becomes apparent why contractors may be reluctant to invest in them," Harris noted.

Yet, looking at the facts and figures, the long-term savings that can be generated from the use of such software show that the cost of investment will be outstripped by its returns. For example, as Harris revealed, research shows that 2% to 3% can be shaved off RFI costs, with total savings of around 8% to 10%, resulting in substantial savings in multi-million ringgit projects.

Malaysia's construction industry is yet to be at the stage where digital 3D modelling is used and shared on a mobile

A 3D model of MEP Coordination, as shown on the Bentley Navigator application.



platform. That being said, Harris Ismail revealed that a number of contractors in the country have already started utilising on-line numerical data and information-sharing.

It may be a slow start for now, but at least there is one. With the CIDB's commitment to advancing technology take-up in the construction industry, it may not be long before mobile devices become an integral part of the Malaysian building landscape.

may differ, their core purpose is to help contractors handle issues such as financing and scheduling.

Additionally, thanks to advances such as Cloud data storage and the Internet of Things – where devices are inter-connected – information-sharing has become more seamless. For example, data can be gathered and compiled on a smartphone before being uploaded onto a Cloud server, which can be extracted

by relevant parties in completing vital tasks, ensuring faster work completion.

Mobile devices and applications are also useful in the management of individual work teams, as supervisors can use workflow programmes to check crew availability, times logged on a project and work progress. The same mobile monitoring and recording concept can be extended to other elements of a construction project

as well, such as the management of material and equipment.

For example, through radio-frequency identification (RFID) tagging, site managers can perform quick stock-checks and data-logs of supplies and machinery as well as chart their use, sending alerts to suppliers for a restock when supplies run low. In addition, since the equipment can be tracked, this helps in reducing instances of workplace theft.

The foray of mobile devices into the realm of construction has introduced increased efficiency and convenience to the entire industry. Their portability and ease of use makes them convenient to utilise even in areas of construction that are not easily accessible, and their connectivity allows for the input and transmission of data with speed and accuracy. Customised applications with simple-to-use interfaces add to their practicality, providing the company with an endlessly improved way of managing their resources. ■

# Making an Impact

## GST AND THE CONSTRUCTION & DEVELOPMENT SECTOR



**A**lthough it has only been a few months since the introduction of the Goods and Services Tax (GST) in Malaysia on the 1st of April this year, the construction and property development sector has been weighing the possible effects of this new tax since it was announced in 2014. Bringing together various stakeholders in the industry, a task force was formed by the Real Estate and Housing Developers' Association Malaysia (REHDA) to discuss and formulate solutions to problems that the industry will face owing to GST. Chairing this task force is Datuk Ng Seing Liong, who highlighted to **Heights**, the concerns of the industry.





A member of the Construction Industry Development Board of Malaysia (CIDB), Datuk Ng is ideally qualified to lead such a task force. Not only is he a contractor, a property developer and past-President of REHDA, he is also a Chartered Accountant and tax consultant, which gives him expert and intimate knowledge of both the construction and taxation sectors.

Presently, all construction and development companies operating in Malaysia are subject to GST. The only exceptions are construction services in Langkawi, Tioman and Labuan owing to their free-port status.



▲ Aside from being a CIDB member, Datuk Ng Seing Liong is also a tax consultant and owner of a construction company, thus giving him unique insight into the effects of GST in the industry.

Under the GST rules, sales of commercial and industrial properties are subject to GST at the standard rate of 6%, while residential properties are exempted. Nevertheless, it is the consensus among industry experts and developers that GST will cause at least a 2.6% increase in the selling prices of property.

One of the main reasons for this is that major building materials, particularly cement, concrete and sand, will become more expensive. Although one of the arguments for the imposition of GST is that the 6% rate is lower than the previous 5% Sales Tax and 10% Service Tax, it should be noted that building components were not subject to such taxes, whereas they are now subject to GST.

One of the proposals by the committee chaired by Datuk Ng is for properties worth RM500,000 and below to be zero-rated, meaning that the GST charges for building materials and construction services be claimed back from the government as an input tax. This

in turn will reduce the burden on developers and lessen the impact on home buyers.

## A More Flexible Rate

At the same time, there has also been a proposal for a more flexible rate with regards to GST. As Datuk Ng explained, "A 6% GST is a very high rate to start off with, especially for the construction industry because components such as cement and steel are very costly. So we asked the government to reduce the rate to a lower figure, such as 2% or 3% for the construction sector."

Elaborating on that point, Datuk Ng highlighted that in some countries where there is GST or an equivalent consumption tax, different items are rated differently. For example, as he told Heights, some goods at supermarkets in Ireland carry 0% VAT (Value-added Tax) whereas others have a 13.5% or 21.5% charge on them.

In addition, while Malaysia's 6% GST is lower than that charged in other countries such as Singapore (7%), >>

## Quick Facts and FAQs on

# GST

### What are the criteria for businesses that have to register for GST?

If the annual income of your business exceeds RM500,000, then you have to register for GST. If the income is below the required threshold, you may still register voluntarily.

### If a single person owns more than one business, does each business' income need to exceed RM500,000 per year to register for GST?

No. If the combined income of all his businesses exceed RM500,000, then he must sign up for GST.

Example: A sole proprietor has 2 businesses (Business A and B). In the past 12 months, the taxable turnover of Business A is RM150,000 and for Business B is RM400,000. To compute his taxable turnover for GST registration purpose, he needs to combine the taxable turnover for Business A and Business B.

As the combined taxable turnover is RM550,000, he must register for GST.

### What does "taxing only the value added at each stage" mean?

Coffee Shop X buys coffee beans from a wholesaler to make your cup of coffee for RM10 (RM10+ 6% GST). The wholesaler keeps RM10 and passes on RM0.60 from Coffee Shop X to the tax authorities.

You buy that cup of coffee from Coffee Shop X, for which the beans were used, and pay RM15.90 (RM15 + 6% GST). Coffee Shop X now keeps RM15 and passes on RM0.30 to the tax authorities (RM0.90 - RM0.60). The reason why Coffee Shop X only passes RM0.30 to the tax authorities is because they have effectively already 'paid' RM0.60 in tax earlier on the first RM10, and only RM0.30 tax is left to be paid on the RM5 "added value".

### Will GST be charged when exporting and importing goods or services out of or into Malaysia?

Exported goods and services are zero-rated, and thus, not applicable to GST. However, imported goods and services are standard-rated, except for tax-exempt items, and are GST-applicable.

### What is "input tax"?

The GST paid by a company to its suppliers (Property Developer A buying materials from Supplier B) is known as input tax, and can be claimed back from the Royal Malaysian Customs Department.

## Stamp Duty

Type of Property : **Commercial**

Property Price : **RM3,000,000**

GST : 6% x RM3,000,000 = **RM180,000**

### Stamp Duty

Stamp Duty (%)	Selling Price (RM)	Stamp Duty (RM)
1%	100,000	100,000
2%	400,000	400,000
3%	2,680,000	2,680,000
<b>Total</b>	<b>3,180,000</b>	<b>3,180,000</b>

Total tax payable : GST + Stamp Duty  
= **RM180,000 + RM89,400 = RM269,400**





Continued from page 33

>> Australia (10%) and New Zealand (15%), we should bear in mind that those countries are more economically developed. Also, in the case of Singapore, GST was introduced at a very low rate of 3% and it has taken more than two decades for it to rise to the present rate.

## Double Taxation Dilemma

It should also be noted that GST will have a significant impact on the commercial and industrial properties

## PROPERTY PRICES ADVERSELY IMPACTED

Calculation of GST impact on houses priced at RM500,000

Items	Break-down of %	RM (per unit)	Existing Sales & Service Tax	GST @ 6%	GST @ 6% RM per unit
Land	15%	75,000	No	No	75,000
Infrastructure & pre-development works	10%	50,000	No	No	50,000
Construction cost (based on pre-GST prices)	46%				
<b>A-Non-Service Taxable</b>					
i) Cement/concrete					
ii) Steel					
iii) Bricks	44%	220,000	No	Yes	233,200
iv) Sands					
<b>B-Service Taxable</b>					
i) Tiles					
ii) Fittings/Sanitary	2%	10,000	Yes (up to 10%)	Yes	10,000
Professional fee & marketing	6%	30,000	No	Yes	30,000
Finance cost	6%	30,000	No	No	30,000
Profit	17%	85,000	No	No	85,000
<b>Total</b>	<b>100%</b>	<b>500,000</b>			<b>513,200</b>

market, which – unlike residential properties – are subject to 6% on point-of-sale. Aside from that, these properties – like residential ones – are also subject to Stamp Duty.

As explained by Datuk Ng, Stamp Duty is calculated as such: “At the first RM100,000 of the value of the property, it is 1%. On the next RM400,000, it is 2%, and it is 3% above RM500,000.” So a property

that is being sold at RM1 million will be subject to a total Stamp Duty charge of RM24,000.

With GST however, the calculation for Stamp Duty occurs after GST has already been factored into the price. In other words, as Datuk Ng pointed out, this is a tax on tax. Therefore, it is only right that Stamp Duty be imposed on the value of the property before GST.

Ultimately, neither Datuk Ng Seing Liong nor any member of his committee begrudge the imposition of GST. “We know that the government needs the revenue,” he explained. “What we want is a win-win situation for the government, the industry and the consumers, because in any country, the people must be happy to pay tax.” It will definitely do the government much good to consider the advice of the construction industry on GST.” ■



The application of technology transcends fields and sectors as the world increasingly finds new innovative uses for science. **Heights** highlights some of the most popular and unique utilisations of technology in the construction industry.

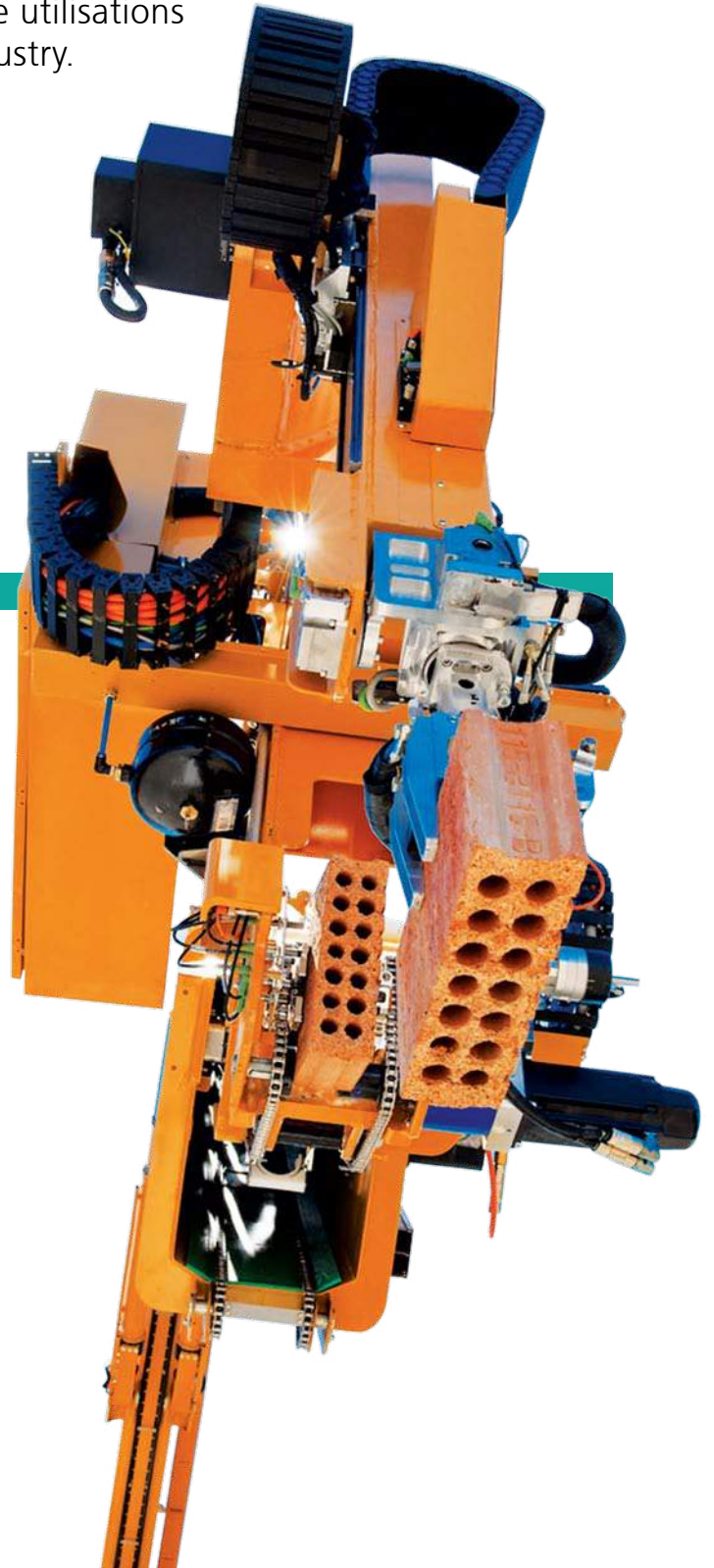


◀ 'Hadrian', the fully-automatic robotic bricklayer capable of building more than 150 homes annually, will be tested in Australian markets first before it is ready to be shipped abroad. ▶

## Faster Builds

In June, engineering company Fastbrick Robotics revealed its fully-automated machine that is capable of laying up to 1,000 bricks per hour – an entire house in two days and more than 150 homes per year. The robot, called Hadrian, operates by creating a computer-aided 3D design brick-laying outline of the structure to be developed, then calculates the location of every brick, which is cut and laid in sequence from a single, fixed location.

To lay the blocks, a 28-metre articulated telescopic boom delivers cement under pressure to a 'laying head', which grips and moves the bricks into the correct position according to the initial 3D design. Hadrian measures, checks for quality, cuts routs for electrical and other services, and trims the bricks to length. The robot builder has been in the making over the past decade, with more than US\$7 million (RM26.5 million) in development costs. Hadrian will be commercialised first in Western Australia, then around the country before being marketed internationally.





# Concrete Solutions

According to a recent *World Business Council for Sustainable Development (WBCSD) report*, after water, concrete is the most widely produced and consumed material globally. Concrete is used in roads, bridges, tunnels, buildings and other infrastructure whose maintenance in the EU alone costs an estimated Euro6 billion (RM25 billion) annually.

This was one of the reasons that the Netherlands' Delft University's Microbiologist, Hendrik Jonkers, developed concrete that heals cracks in itself. Bacteria (which can lay dormant for 200 years) is distributed throughout a concrete mass, and triggered to produce limestone which binds the cracks when water or atmospheric moisture find their way into the chinks.

The industry solution, while already available in three forms – a spray for small cracks in existing construction, repair mortar for larger fractures, and the self-healing concrete for new structures – can currently only be used for cracks that are less than 0.8 millimetres wide. It also costs slightly more, at Euro100 (RM416) for a cubic metre of self-healing concrete compared with Euro70 (RM291) for conventional mixes. It has already been tested in Ecuador's Llanganates National Park's Cruzsacha canal and irrigation system.



▲ Microbiologist Hendrik Jonkers and volunteers apply self-healing concrete to Ecuador's Cruzsacha canal and irrigation system, which supplies water to 7 communities and more than 400 families.



## Fabricated Dwellings

From automotive to aviation, 3D printing has found use in a wide range of applications as experts estimate that the technology can enhance productivity. It also boosts economic returns and increases sustainability, through reducing production times by up to 70%, labour costs by around 80%, and saving between 30% and 60% of construction waste.



## Castles in the Air?

Not according to Minnesota, United States resident, Andrey Rudenko, who designed and built over two years the world's first 3D-printed castle in his backyard. After numerous trials and errors, and experiments on materials, concrete mixes and settings, he finally settled for 10-millimetre high and 30-millimetre wide layers made by his self-built 3D printer.

Measuring 15 square metres, the castle was built as a test-run for further developments which Rudenko said will be implemented in one piece. This is because printing some components of the castle, such as the turrets, was a bad idea as moving and placing them was extremely difficult. He also indicated that he is working on redesigning his 3D printer to work 24 hours every day until the next project – a full-scale, two-storey liveable house – is complete.

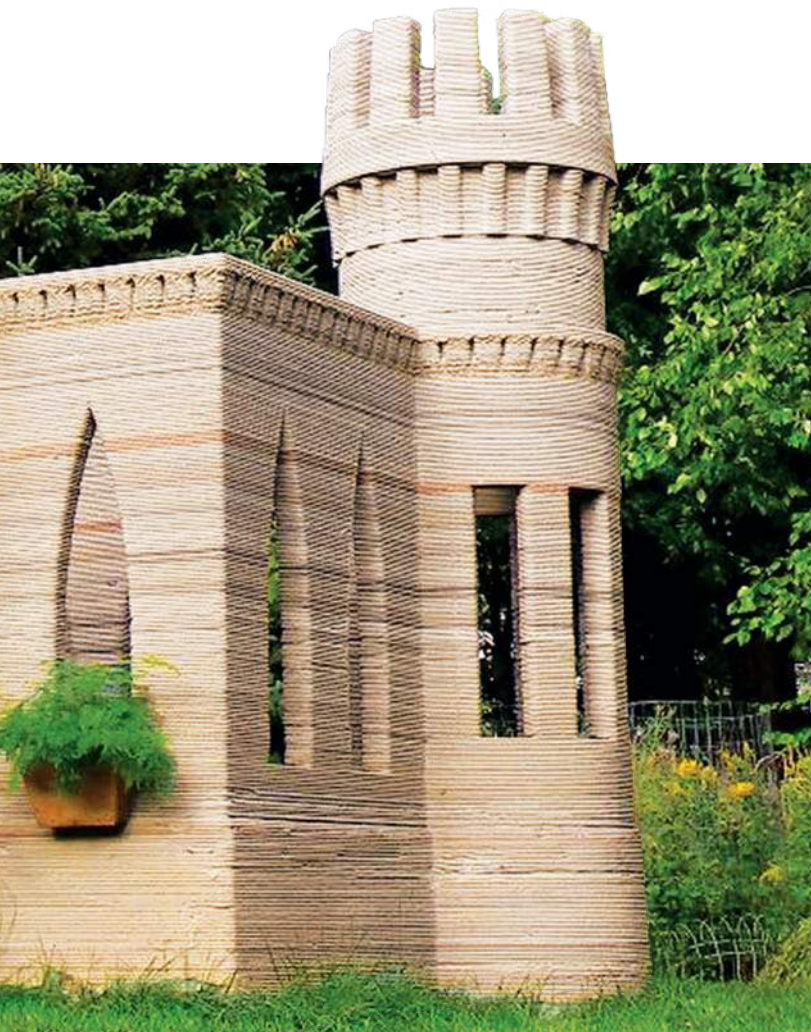
Andrey Rudenko's castle that he 3D-printed in his backyard using a self-made, custom 3D printing machine. Rudenko plans to print a bigger, two-storey, liveable home soon.







▲  
The sprawling 1,115-square metre mansion created by China's WinSun Decoration Design Engineering Co, one of the company's recent forays into 3D-printing housing development.



## Abodes for Less

From Chinese 3D technology company WinSun Decoration Design Engineering Co., comes a new project: a 1,115-square metre mansion made from recycled stone and construction waste materials. The massive project cost around US\$161,000 (RM602,000) to build, owing to the use of reclaimed materials and reduced labour, and required a custom-made 6-metre tall 3D printer.

WinSun's earlier projects include the 2014 construction of a small 3D-printed community comprising 10 units of 200-square metre homes. Also made partly from recycled construction and industrial waste, as well as glass fibres, the smaller buildings were assembled on-site in one day and sold for US\$5,000 (RM18,695) apiece.

# AN INDIAN SUMMER

As the world's second most populous country with 1.25 billion people, and a major emerging economy, India has ambitious plans for its building and infrastructure sectors to match its size and stature. Under the country's 12th Five-Year Plan (2012–2017), investment in infrastructure is projected to reach US\$1 trillion (RM3.74 trillion). Also, over the next 20 years, US\$650 billion (RM2.43 trillion) is expected to be pumped into enhancing the South Asian nation's infrastructure.

India is laying out the welcome mat for foreign investors and players in the construction sector. **Heights** highlights the opportunities in India as part of our Going Global series.







## Why India?

The 10th largest economy in the world, according to the World Bank, India's initial foray into economic liberalisation took place in 1991 under the direction of then Finance Minister Manmohan Singh. After taking office as Prime Minister (2004–2014), Singh accelerated reforms, and this policy of liberalisation has since been continued by the administration of Narendra Modi (2014 – present).

There are various pull-factors for investors in India. For instance, according to research by management consulting firm McKinsey, India's economy is forecast to grow fivefold over the next 20 years. In addition, financial services giant Morgan Stanley expects an average GDP increase of at least 9% in the next quarter of a century.

Also working to India's advantage is its population, which is young and expected to reach a median age of just 30 by 2025. Its current working population is 530 million and by 2021, the percentage of people of working age (15–59) is estimated to reach 64%. Other elements that make India attractive to investors are its well-educated workforce and the fact that most professionals can communicate in English.

For Malaysian investors, one other plus point about India is the legal system which is similar to Malaysia's. Thus, any potential disputes will be handled in a jurisdiction and manner that will be familiar to them.

## Overview of Sector

Valued at over US\$126 billion (RM470 billion), the construction industry in India is the second largest contributor to GDP and employment (35 million jobs) after agriculture. The sector has strong potential for growth, boosted in part by increased urbanisation in India. To illustrate, by the year 2030, Indian cities will be home to approximately 590 million people.

Aside from this boost to residential real estate construction, infrastructure development is another area that will do well in the short-term as well as the long-term future. Already, it accounts for 50% of activity in the Indian construction sector, with the Indian government identifying infrastructure as “a key thrust area.”

From 2001 to 2013, the construction sector accounted for 11% of all FDIs into India – the second highest after services. Even so, the need to boost activity in the industry resulted in the Modi government easing rules for foreign investors in construction.

Among the reforms are reducing the minimum build-up area of projects open to foreign investment from 50,000 sq m to 20,000 sq m, and lowering the minimum investment capital from US\$10 million (RM37.38 million) to US\$5 million (RM18.69 million). There remains, however, a lock-in period of three years, during which the initial capital invested cannot be repatriated.

## Relevant Agencies

Foreign investors in India usually need to deal with a number of government authorities and agencies, and the two which foreign firms will deal with the most are the Foreign Investment Promotion Board (FIPB), and the Secretariat for Industrial Assistance (SIA).

The FIPB is set up to facilitate the inflow of FDIs into India and the provision of necessary guidelines and promotions. It is also the body that approves any requests for early exit before the three-year minimum lock-in period for foreign investments has passed.

The SIA is a part of the Department of Industrial Policy and Promotion under the Ministry of Commerce and Industry. Its goal is to be a single-window, one-stop centre for investments and entrepreneurs,



An artist's impression of the Gujarat International Finance Tec-City – measuring 3.59 sq km and costing US\$11 billion (RM41.12 billion), it is to be the central business district of Gujarat and will be a hub for high-tech and finance firms.

“The scope and potential, the breadth and length of infrastructure and related developments is very huge in India.”

– Narendra Modi, Prime Minister of India



and is responsible for assisting entrepreneurs and foreign investors in the processing of applications, as well as the monitoring of projects.

## Hints and Tips for Malaysian Investors

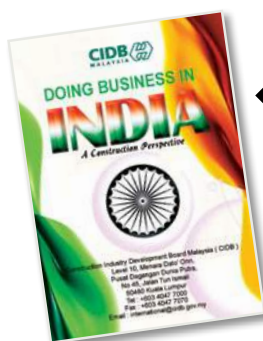
While India holds much promise and opportunity for construction firms, foreign companies may find some problems penetrating into it, mainly because of a lack of understanding of local business culture.

The Construction Industry Development Board (CIDB) of Malaysia has published a guidebook to investing in India – *Doing Business in India* – in which it highlights some of the more common mistakes that Malaysian companies make in the South Asian nation.

First and foremost, is an “insufficient understanding of India’s market structure and character,” as well as of “social and political dynamics in the country.” To illustrate, India is a highly competitive market, and it is possible that some local partners might not do everything according to the book.

Local knowledge is therefore of utmost importance, and this comes from selecting the right partner. According to *Doing Business in India*, Malaysian companies venturing to India should select partners with complementing core competencies and avoid those with competing and overlapping business portfolios. In addition, it is important to partner firms with global exposure and sound management capabilities as that is a strong indication of integrity.





Published by CIDB, *Doing Business in India* is a handbook that provides information on the status, opportunities and risks of the Indian construction sector. It is available for download on the CIDB website.

Ultimately, one needs to bear in mind that some of the top international companies in the world have been operating in India for decades and have made a good show in one of the world's largest domestic consumption markets. India has much to offer investors in construction and infrastructure development, but such companies will need to do it the Indian Way in order to thrive. ■

## Bilaterals Collaborations



Malaysian construction companies have a total of two decades of experience in India. According to Dato' Sri Zohari Akob, Secretary General of Ministry of Works, among the projects in India completed by Malaysian companies are 54 highway and road projects worth RM 9.3 billion.

These partnerships have been further strengthened thanks to an agreement signed between CIDB and the National Buildings Construction Corporation (NBCC) – India's largest state-owned construction company. As a result Malaysian and Indian construction firms have the opportunity to work together on strategic infrastructure projects in both countries.

The Memorandum of Understanding (MoU) was inked during a visit by an NBCC delegation – led by Chairman and Managing Director Dr Anoop Kumar Mittal – to Malaysia. Representing the Indian company was its Chief General Manager Nirmal Prakash Aggraval while Abdul Latif Hitam – the CEO of CIDB subsidiary, CIDB Holdings – signed on behalf of the Malaysian side.

Speaking on the MoU, CIDB CEO Dato' Sri Ir Dr Judin Abdul Karim noted that this will "enhance the opportunity for Malaysian companies to embark on projects globally with NBCC and offer value propositions together with experience and expertise in infrastructure projects."

CIDB Holdings spearheads CIDB's Going Global initiative, while NBCC has 36 real estate projects worth US\$1 billion throughout India, as well as having worked on others in Botswana, Nepal, Libya, Iraq, Yemen, Turkey, Maldives and Mauritius.

Aside from the agreement with NBCC, CIDB further strengthened the potential for partnerships between Malaysian and Indian contractors when it played host to a delegation from India's Ministry of Road Transport and Highways in April this year.

Led by the Ministry's Secretary Vijay Chhibber, the delegation invited Malaysian construction firms to participate in India's highway construction projects during a CIDB-organised workshop aimed at introducing India's Hybrid Annuity scheme to Malaysian contractors.

According to Chhibber, "Under the new hybrid annuity model, not only will the National Highway Authority of India support 40% of the project cost in five equal installments, the government will also bear the revenue risk in projects with a low anticipation of traffic flow."

In addition, the Ministry Secretary also revealed that there are 7 highway projects worth US\$2.7 billion that are to be awarded under this scheme from April to September this year. He also informed Malaysian contractors that they can be involved in projects either through direct participation, by being an Engineering, Procurement and Commissioning (EPC) contractor, or by providing services that will lead to improved quality of construction or a reduction of time.

# TWO DECADES OF DEVELOPMENT

## CIDB SETS THE WAY FOR A WORLD-CLASS CONSTRUCTION SECTOR

**“W**hy is there a government body to aid in the development of the film industry but none for construction?” Such was, more or less, the point the present Chairman of the Construction Industry Development Board of Malaysia (CIDB) Tan Sri Dr Ahmad Tajuddin Ali made to the then Minister of Works Tan Sri Leo Moggie in the early 1990s. Undoubtedly, the matter highlighted by Tan Sri Ahmad Tajuddin – who was at that time Director-General of Standards and Industrial Research Institute of Malaysia (SIRIM) – resonated with the Minister, because just six months later, the first draft of a Bill setting up the CIDB was ready.









That Bill would go on to be passed by Parliament and gazetted as the *Construction Industry Development Board Act 1994* (or Act 520) and shortly afterwards, the CIDB was established in April 1995. It was a momentous and timely decision, as Malaysia's economy was booming and so too was the construction industry.

This was a period when a number of major building and infrastructure projects were in the pipeline. Some examples of these included the KL International Airport, the Petronas Twin Towers, the Second Link between Johor and Singapore, and Bakun Dam in Sarawak.

## Growing Pains

As the body entrusted with overseeing and regulating the fast-growing construction industry, with the overall aim of enhancing its quality, productivity and capacity, the CIDB had an important but heavy load placed on its shoulders.

After all, it was a new agency (so new in fact that it had to borrow equipment from other government agencies) and

yet it had remit over a large and well-established sector which contributed – at that time – at least 4% to the GDP (it has since increased).

Although there were growing pains and teething problems, the fledging organisation soon managed to find its feet, thanks to its small but dedicated team of pioneer staff. One such trailblazer, CIDB's current Senior General Manager for the Corporate and Business Sector Sr Sariah Abdul Karib, noted, "In the early years, there were hardly 20 of us. However, there were no barriers at all and everybody worked for the whole of CIDB."

## Making an Impact

Having consolidated its position, one of the first major decisions undertaken by the CIDB was to strengthen its reach and database by registering contractors in operation in Malaysia. Also, as the CIDB is tasked with facilitating the development of the construction profession, it introduced the Construction Personnel Registration Card in 1997.



"We are entering into an era of continued growth as we position ourselves into the new millennium when we become an industrialised nation, with not only manufactured goods to export but also skills and expertise to sell overseas. In order to fulfil this aspiration, the construction industry needs to be guided, nurtured and developed to attain the required quality."

– Then Minister of Works Tan Sri Leo Moggie during the ceremony to establish the CIDB



In order to enhance professionalism in the construction sector, the CIDB set up the Akademi Binaan Malaysia (Malaysian Building Academy – ABM), of which there are now six campuses across the country. In this picture an ABM instructor guides one of the students.



Better known as the CIDB Green Card, its aim is to register and accredit construction personnel in order to increase safety at work sites. As such, all workers are required to undergo safety courses prior to receiving the card, which also provides them with *Takaful* (Islamic insurance) coverage.

That same year, the first *Akademi Binaan Malaysia* (Malaysian Building Academy – ABM) was established. In line with the CIDB's responsibility of human capital enhancement in the construction industry, the ABMs (of which there are now six throughout the country) provide formalised training to ensure the

“I told the Minister, ‘the construction industry is left to fend for itself. There is no construction industry development board but there is one in Singapore and one in the UK... A working committee was set up by the Ministry of Works and within six months, the draft CIDB Act was ready!’”

– CIDB Chairman  
*Tan Sri Dr Ahmad Tajuddin Ali*  
on how the CIDB came to be.



development of professional and skilled construction workers.

This has been made possible through collaborations with major industry players such as Bayer, Lafarge, Akzon Nobel and Panasonic, while the ABM's courses and syllabuses are periodically reviewed so that the skills being taught are up-to-date with industry requirements. All in all, more than 250,000 workers, armed with knowledge and practical ability in various construction trades, have passed through the various ABMs. Strengthening the capacity of construction workforce and the level of health and safety standards at work sites were also stepping stones towards the enhancement of building quality. A significant step towards becoming a world-class industry, CIDB's drive for quality is manifested

in the *Quality Assessment System in Construction* (QLASSIC).

Introduced in 2007, QLASSIC is based on the *Construction Industry Standard* (CIS 7:2006) and sets a benchmark for the quality of workmanship on construction projects. While the adoption of QLASSIC is voluntary, a number of large contractors have already implemented it, so that their buildings will meet world-class standards.

It should also be noted that the CIDB is not only concerned with the physical work of construction, but every aspect that touches the industry. To illustrate, for a long time, prompt payment was one of the biggest problems between contractors, sub-contractors and developers, with disputes causing delays to the completion of the projects.



## CIDB 20TH ANNIVERSARY PLANNED ACTIVITIES

**Launch of Construction Industry Magazine, "Heights" (formerly known as CIDB News)**

**Launch of CIP in Conjunction with ICW 2015**

**Media Awards in Conjunction with KKR Media Night**

**Quality Recognition Day**

**Launch of Youth Program/Lego Competition**

**Launch of MyCrest**

**20 Years Anniversary Dinner & Fellowship Recognition and Exhibition**

**CIDB Partner's Day**

**Bina Malaysia Miniature Competition**

**Arena of Youth (The Future is yet to come)**

**Construction Industry Marathon/Treasure Hunt**

As such the CIDB was instrumental in initiating the *Construction Industry Payment and Adjudication Act (CIPAA)*, which was passed in 2011 and which came into force in April last year. Under this law, payment disputes in the construction sector are now being resolved in a timelier and more efficient manner.

Aside from the CIPAA, the CIDB also led the way in the setting up of two construction courts in April 2013. Taking into consideration that most legal conflicts involving construction were highly complex and technical, these two courts – which are presided over by highly experienced construction judges – ensure speedier resolution of cases.

### Beyond Malaysia

All these initiatives have helped the Malaysian construction industry move up the value chain. In fact, such is the high regard for Malaysian contractors in many parts of the world that a number of them have been and are involved in large building projects in Indonesia, India and the Middle East.

More than just create the eco-system for these firms to thrive and therefore showcase their abilities to would-be foreign partners, the CIDB has also actively promoted Malaysian construction on international visits. Through meetings with foreign

government officials, it has managed to secure deals benefitting industry players in Malaysia.

### Ready for the Future

There is no question that the CIDB has achieved much in transforming the Malaysian construction industry over the past two decades. However, with the deadline for the country to become fully-developed by the year 2020, this is no time for it to rest on its laurels.

It understands this, and so too do the authorities. This is why under the *Construction Industry Development Board Act (Amendment 2011)*, which was gazetted in June this year, the CIDB has been given new powers and responsibilities. Among them is the authority to enforce safety standards for construction and regulate the quality of all building materials.

Furthermore, the *Construction Industry Transformation Programme (CITP)* will be launched in September this year at the CIDB-organised *International Construction Week (ICW)* – the largest construction event in Southeast Asia. Marking a final big push towards the realisation of Vision 2020, the CITP aims to lay out the course for the Malaysian construction industry to be on par with those in developed nations in terms of professionalism, safety, quality and productivity.

These efforts by the CIDB to enhance the construction sector are timely and puts the industry on the right trajectory to meet the needs of a developed economy. That being said, there is absolute certainty that even after the targets are met, the CIDB will continue to work at enhancing the industry, just as it has been doing for the past 20 years. After all, excellence is not static, it keeps on moving, and the CIDB ensures that the Malaysian construction industry is moving alongside it. ■





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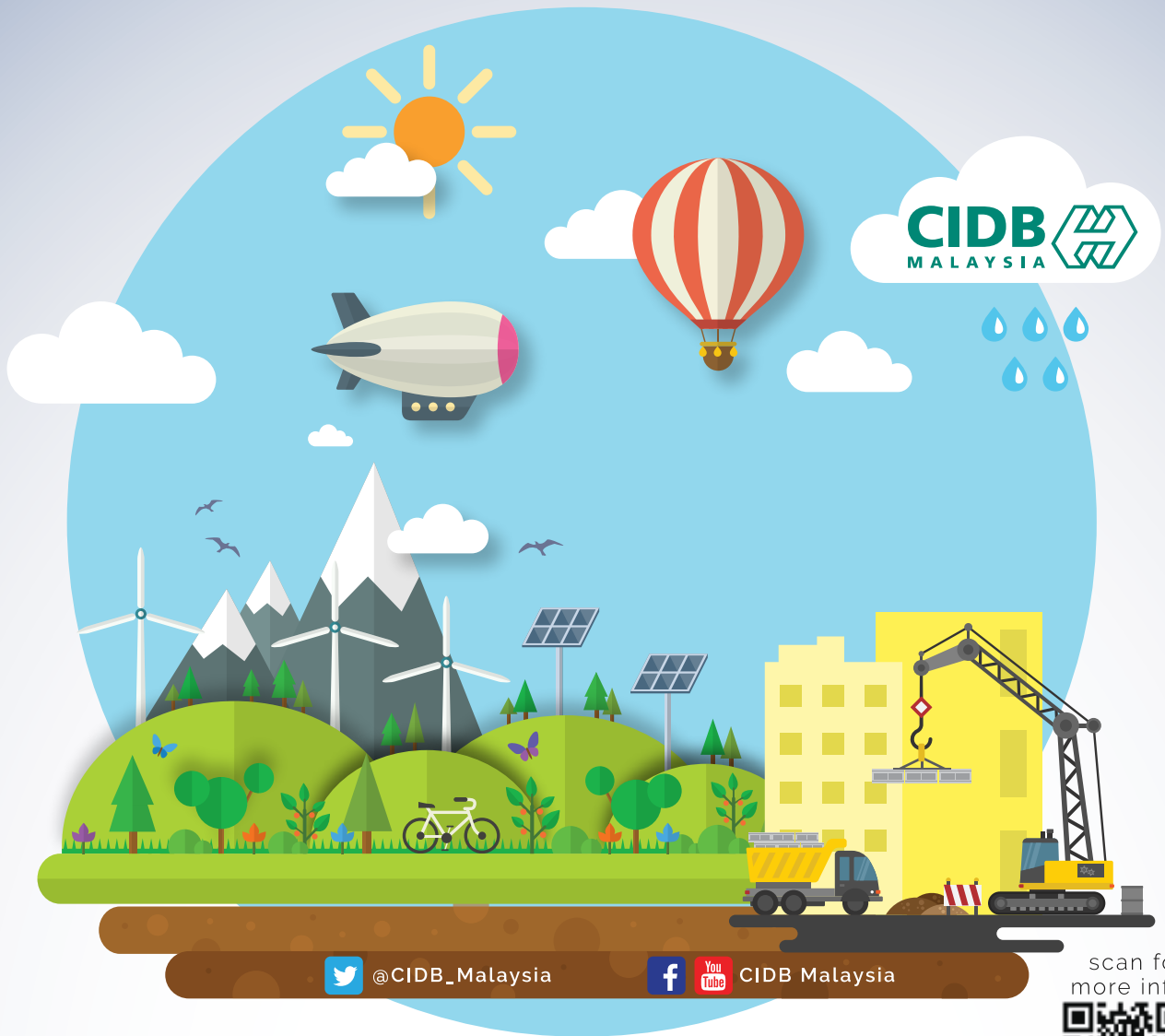
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# INTERNATIONAL CONSTRUCTION WEEK



**CIDB**  
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# TOGETHER

WE DEVELOP THE  
MALAYSIAN CONSTRUCTION  
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GLOBAL COMPETITIVENESS.



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Email: cidb@cidb.gov.my  
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The Construction Industry Development Board was established under the Construction Industry Development Act (Act 520) to develop the capacity and capability of the construction industry through enhancement of quality and productivity by placing great emphasis on professionalism, innovation and knowledge in the endeavour to improve the quality of life.