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# <u>cover note</u>

#### 58 Years of Service Commitment



by Ir. Mohd. Khir bin Muhammad Bulletin Editor

he Institution of Engineers, Malaysia became a year older on 15 April 2017, celebrating its 58th year of inception. IEM has come a long way from a handful of interested engineers putting in efforts to form an Institution to signify the independence of Malaysian engineers.

Today, IEM is the largest learned society in the country, with over 42,000 members, including students. *JURUTERA*, with a monthly circulation of 22,500 copies as well as online accessibility through its web portal, continues to disseminate information and to reach out to its members nationwide.

Since 2010, IEM has set about to improve its services to members by providing more online services. These include simplification of annual subscription payment, registration for events organised by IEM as well as e-Books where members can access the e-Library from wherever they are. The IEM portal also keeps CPD records which members can access as well as print, from as far back as 2012.

To ensure all members are kept up to date with information from IEM, we would like to advise members to update address changes or contact information in the portal. You can access the portal at www. myiem.org.my. Create a login and password and you will be able to access your records in our database. You can also indicate whether you wish to have your contact information published on the website. I hope all members will make full use of the services provided.

To all our members and readers, thank you for your continued support of *JURUTERA*. ■



#### CONGRATULATIONS

Congratulations to **Y.Bhg. Dato' Ir. David Lee Hoke Hai** *Past Chairman of Southern Branch* who received the title of Darjah Kebesaran Sultan Ahmad Shah Pahang Yang Amat Di Mulia – Peringkat Kedua, (DSAP) from Duli Yang Maha Mulia Sultan Pahang on the occasion of His Royal Highness's birthday.

**ANNUAL DINNER AWARDS NIGHT** 

SAIIGHT

2017

IEM strives to truly represent not only all engineers but also the whole engineering fraternity

The 58th IEM Annual Dinner & Awards Night was clearly an occasion to be proud of. The Institution was celebrating 58 years of professionalism as its members combined passion for engineering with community, country and international involvement.

very year, the tradition of this IEM event is highly anticipated and members look forward to greeting and catching up with old friends, to network and to enjoy a fine dinner with much celebration.

It also provides the opportunity to honour men and women engineers as well as engineering fraternities that are worthy of recognition.

This year's event started at 7.00 p.m. with a pre-dinner cocktail reception that gave everyone the chance to mingle.

The elegant atmosphere of the ballroom at One World Hotel, Petaling Jaya, set the tone for a wonderful evening with lively entertainment by the All Girls Band, singing sensation and the first Malaysian Idol Jaclyn Victor, and 2016 Laugh Factory Funniest Person In The World, Harith Iskander. Of course, there were also the endless networking, delicious food and an awe-inspiring awards ceremony.

TH

Among those present were heads and representatives of various government departments, statutory bodies, institutions of higher learning, professional bodies, the industry, presidents and representatives of the ASEAN Federation of Engineering Organisations (AFEO) and the Federation of Engineering Institutions of Asia and the Pacific (FEIAP), past presidents of IEM, IEM council members and IEM branch chairmen. Being a First World engineer entails an elevated level of professionalism and expertise among engineers. In this context, I believe IEM is playing a significant role in the upgrading of expertise among the engineers and engineering professionals.

> Datuk Seri Ir. Dr Wee Ka Siong Minister in Prime Minister's Department

The guest of honour was Datuk Seri Ir. Dr Wee Ka Siong, Minister in the Prime Minister's Department.

In his speech, Datuk Seri Ir. Dr Wee called on IEM – in line with the Institution's theme of "Towards First World Engineers" – to focus, energise and synergise the cumulative engineering and technological wealth of experience of its members as well as to proactively confront the challenges of the future so as to elevate Malaysia into a fully developed nation.

He said First World technologies are merging at a faster rate now than at any other time in history and there is a need to be ready to continuously learn, adapt and update in order to accomplish and excel.

"Being a First World engineer entails an elevated level of professionalism and expertise among engineers," he added. "In this context, I believe IEM is playing a significant role in the upgrading of expertise among engineers and engineering professionals."

He also noted that it was pertinent for IEM to provide avenues for IEM members to meet members of other professional organisations for discussions on matters relating to the various professional fields.

"This way, the standard of professionalism in the country can be upgraded and the creative abilities of the various professionals can be harnessed to meet the challenges facing the country," said Datuk Seri Ir. Dr Wee.

"By overcoming the challenges, we will be able to ensure a better quality of life for Malaysians."

He extolled IEM's role in providing continuing professional development (CPD); IEM coordinates graduates and experienced engineers, industry, private training companies and universities to work together to keep its members updated on current and progressive technological changes.

He noted that, with the rapid pace of technological development today, engineers must adopt a programme of lifelong learning through CPD.

In this respect, he urged established engineers to serve as instructors/mentors to pass on their wealth of knowledge to undergraduates and novice engineers. If at all possible, there should be seamless transfer and movement of practitioners from the government and private sectors into academia.

He said luminaries in both sectors should be encouraged to teach and share their knowledge and experiences in universities, colleges and learned institutions such as IEM as this will help raise the quality and standards of the practice and profession. On the economic front, Datuk Seri Ir. Dr Wee said he believes a dynamic engineering profession can help boost the country's engines of growth and place it on the path of steady development.

He also drew on his own experiences to paint a picture of engineering as one of the noblest callings in life, and pointed out that "it is engineers who build the world and it is engineers who contribute to progress".

He related how, when industrialisation took off in the country in the second half of the 20th century, engineering was the driving force for economic development and growth.

He said: "Your imprint is evident in countless mega infrastructure projects such as ports, airports, roads, telecommunications as well as commercial, industrial and housing development.

"Engineers are indeed innovators, creators, builders, problem solvers and enablers of progress. You have made possible the transformation of our economy and society from one that was agriculture-based to rapid industrialisation and enhanced quality of living.

"In my view, IEM can stand proud as it has achieved many significant milestones at national and international levels."

When Datuk Seri Ir. Dr Wee concluded his speech, he was presented with the AFEO Distinguished Honorary Fellow Award by IEM President Ir. Tan Yean Chin, on behalf of AFEO, in recognition of his contribution to the engineering industry and profession in Malaysia.

Earlier, in his welcome address, Ir. Tan acknowledged the valued contributions of past IEM council members, the technical divisions, special interest groups, Young Engineers and the Women Engineers Sections as well as the 12 state branches which had worked very hard to organise various programmes for the members.

He said they had successfully pushed forward the Institution's vision/interest and given its members the exposure to the latest trends and technologies in engineering.

He also acknowledged those at the IEM headquarters and branch levels who continued to engage government agencies, ministries and state governments by serving on various advisory committees at state and national levels.

With impending changes and development of more engineering disciplines, we need to bring into IEM's fold relevant professions such as engineering technologists, technicians and engineers who work in new and nontraditional engineering sectors. We need to make IEM an inclusive institution for continued growth and to stay relevant for long-term sustainability.

> Ir. Tan Yean Chin IEM President

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# **COVER STORY**



Ir. Tan said that by serving on such committees, IEM members had endeavoured to further the Institution's objective to promote and advance the science and practice of engineering in the country.

#### **ONE-FOR-ALL FOR SUSTAINABILITY**

Earlier that day, during the Institution's annual general meeting (AGM) in the morning, Ir. Tan delivered his presidential address titled "Inclusive IEM For Sustainability".

He called on all members to move towards making IEM sustainable in growth and for it to truly represent, not only engineers, but also the whole engineering fraternity.

Highlighting the impending changes and the development of more engineering disciplines, he said it was important that IEM stayed relevant with the ever-changing engineering landscape in Malaysia and to find fresh ways to attract new members and maintaining the existing ones.

He saw the need to include professionals such as engineering technologists, technicians and engineers who work in new, non-traditional engineering sectors. To cater to a wider range of membership from young engineers, women engineers, engineering technologists and engineering technicians, he said IEM must adopt innovative ways such as providing them with a better platform to perform and helping them advance in their career.

Graduate members such as young engineers and women engineers should be the main force behind IEM's rejuvenation for long-term sustainability, he said.

Currently, there are 81 engineering technologists and 37 engineering technicians who are members of IEM. Ir. Tan said the activities and networking opportunities offered by the Institution would help them in their career advancement.

Ir. Tan said IEM currently represents Malaysia as the signatory for the International Engineering Technologists Agreement (IETA). IEM has to work towards becoming signatories for the country for IETA and the Agreement for International Engineering Technicians (AEIT).

#### **NO. 1 PLAYER IN ENGINEERING FRATERNITY**

Ir. Tan said IEM is the principal player in the ASEAN Federation of Engineering Organisations (AFEO) and the Federation of



Engineering Institutions of Asia and the Pacific (FEIAP) and is the permanent secretariat and secretary general of both AFEO and FEIAP.

At present, FEIAP is working closely with UNESCO on a project to strengthen and upgrade the quality of engineering education and to enable the mobility of engineers between Asia, the Pacific region and Africa.

IEM is also well represented internationally in the World Federation of Engineering Organisation (WFEO), Commonwealth Engineers Council (CEC), Federation of Engineering Institutions of Islamic Countries (FEIIC), APEC Engineers Coordinating Committee, and Asian Pacific Confederation of Chemical Engineering (APCChe).

#### STARK REALITIES OF TODAY

On the home front, IEM is concerned over the decline in the number of secondary school students taking up science, technology, engineering and mathematics (STEM) subjects.

Ir. Tan noted that currently, less than 30 per cent of Form 4 students in Malaysia are in the science stream compared to 50 per cent many years ago (the country is targeting 60 per cent).

Citing World Economic Forum 2016 figures, he said 80 per cent of jobs in the future will require some form of STEM background or education.

By 2020, it is predicted that two million jobs to be created worldwide will be related to the fields of computer, mathematics and engineering.

"If we do not have a big pool of students doing STEM in Forms 4 and 5, the number of students doing engineering in universities will drop and this will not augur well for a

# COVER STORY \_

developing country like ours which needs more engineers," he said, adding that IEM had teamed up with universities and other professional bodies to promote STEM education.

For example, IEM was part of the organising team for the Kuala Lumpur Engineering and Science Fair (KLESF) for the last three years.

#### INSPIRING AWARD CEREMONY

The award conferment on Datuk Seri Ir. Dr Wee was followed by a number of presentations to outstanding achievers and other well deserved recipients.

Among the awards were Best Engineering Students in Local Universities, Most Improved Technical Division and Merit Awards, and Most Supportive Organisation/Individual which encouraged employees/fellow engineers or colleagues to become Graduate and Corporate Members of IEM.

The other awards were for the most supportive organisation and individual, and the most active organisation in IEM's membership drive activities.

The presentations were followed by the IEM Honorary Membership Award conferred on Professor Emeritus Dato' Dr Hassan Said, Vice-Chancellor of Universiti Teknologi MARA (UiTM), and the IEM Honorary Fellow Award to Professor Dr Shahbaz Khan, Regional Director, UNESCO Regional Science Bureau for Asia and the Pacific in Jakarta, Indonesia. Both were recognised for their outstanding services to the engineering profession and/or to IEM.

Meanwhile, Eco World Development Group Bhd. (property development), Ekovest Bhd (construction), IJM-JAKS joint venture (water), Malaysia LNG Sdn. Bhd. (energy) and Rapid Rail Sdn. Bhd. (transportation) were each presented with the IEM Award for Contribution to Engineering Industry in Malaysia.

Eco World Development Group owns about 8,000 acres of land with a total gross development value of

RM87.5 billion. Through Eco World International, the brand has extended its reach to London in the UK and Sydney in Australia.

Ekovest is one of the country's leading construction companies involved in major civil engineering and building works like turnkey, design and build projects as well as project management.

IJM-JAKS is a joint venture between conglomerate IJM and JAKS Resources Bhd., engaged in the integrated water works industry. They teamed up for the Pahang-Selangor Raw Water Transfer project.

Malaysia LNG or MLNG's business activities include acquiring natural gas from offshore partners, liquefaction of natural gas and delivering of products to customers while Rapid Rail is the country's pioneer in the urban rail industry.

Finally, the 2017 Outstanding Engineering Achievement Award which recognises a distinguished engineering achievement within Malaysia, went to the Malikai Deepwater Tension Leg Platform project by Shell Projects and Technology, Malaysia.

The basis for this award, one of the most prestigious recognitions of the evening, was an engineering achievement that demonstrated exceptional engineering skills which had made significant contributions to the engineering progress and quality of life in the country.

Malikai is Shell's second deepwater project in the country and features the first tension leg platform here, a floating oil production facility moored to the seabed, 500m underwater.

All good things must come to an end. The evening concluded at about 11.30 p.m., as pleasantly as it had begun.

The event organising committee, led by the Mechanical Engineering Technical Division, had done a terrific job!

From the Institution, a big "thank you" to them for their hard work in putting together such a great evening.



# **COVER STORY**

#### IEM GOLD MEDAL AWARD 2016

NO	STUDENT NAME	UNIVERSITY
1	Chiew Siew Mee	The Asian Institute of Medicine, Science And Technology (AIMST) University (SEMELING CAMPUS)
2	Phoo Khai Meng	Asia Pacific University of Technology & Innovation (A.P.U.)
3	Chong Yun Jia	Curtin University of Technology (Sarawak Campus) Malaysia
4	Nur Firda Ayu Binti Jamal	International Islamic University Malaysia (IIUM)
5	Cheah Soon Yi	INTI International University (INTI IU), Persiaran Perdana BBN, Putra Nilai
6	Phang Sheh Lee	KDU Penang University College
7	Choo Jian Cheng	KDU University College, Utropolis Glenmarie
8	Koh Mun Fei	Manipal International University
9	Ngu Ching Yee	Multimedia University (Cyberjaya Kampus)
10	Fletcher Sarip	Monash Universiti Malaysia (Sunway Kampus)
11	Elwin Heng Chia Jie	Nilai University Main Campus
12	Lai Yew Veng, Calvin	Segi University
13	Tan Jia Jia, Adeline	Swinburne University of Technology (Sarawak Kampus)
14	Heng Jing Lei	Taylor's University Lakeside Campus
15	Ong Chew Yi	The University of Nottingham (Kampus Malaysia)
16	Zulkhibri Bin Baharom	Terengganu Advanced Technical Institute (TATI) University College
17	Lim Jay Ming	Tunku Abdul Rahman University College (TARC)
18	Onn Sze Kai	"UCSI University Kuala Lumpur Campus (South Wing)"
19	Lim Yong Tat	University College of Technology Sarawak (UCTS)
20	Azwan Bin Abdullah	Universiti Teknologi MARA (UiTM)
21	Nurul Ashikin binti Mohd Nazrul Aman	Universiti Kebangsaan Malaysia (UKM)
22	Daud Bin Hashim	University Kuala Lumpur- Malaysian France Institute (MFI)
23	Muhammad Nor Bin Abdul Rashid	Universiti Malaya (UM)
24	Lee Chien Xiang	Universiti Malaysia Pahang (UMP)
25	Joanna Thien Sie Yin	Universiti Malaysia Sabah (UMS)
26	Muhammad Adam Bin Hamidon	Universiti Malaysia Perlis (UniMAP)
27	Winnie Anak Renang	Universiti Malaysia Sarawak (UNIMAS)
28	Norbahrin Bin Baharudin	Universiti Industri Selangor (UNISEL)
29	Gan Chee Kai	Universiti Tenaga Nasional (UNITEN)
30	Lee Tian Sang	Universiti Putra Malaysia
31	Ng Wei Kuan	Universiti Pertahanan Malaysia (UPNM)
32	Lim Yen Ruen	Universiti Sains Malaysia (USM)
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34	Ong Sze Mun	Universiti Teknikal Malaysia Melaka (UTeM)
35	Syaiful Azmirul Bin Mohd Rozlan	Universiti Tun Hussein Onn Malaysia (UTHM)

36	Mohd Anas Bin Asalem	Universiti Teknologi Malaysia (UTM)
37	Muhammad Syukri Bin Norhamshah	Malaysia – Japan International Institute of Technology (MJIIT), University Teknologi Malaysia Kuala Lumpur,
38	Mohd Shahrul Azhar Bin Mohd Long	Universiti Teknologi PETRONAS (UTP), Bandar Seri Iskandar

#### **IEM PRESIDENTIAL AWARDS OF EXCELLENCE 2016**

PLACING	TYPE OF AWARD	CHAIRMAN	PRIZES
5th Placing	Project Management Technical Division	Ir. Dr Ahmad Anuar Bin Othman	Certificate
4th Placing	Mechanical Engineering Technical Division	Dr Kannan M Munisamy	Certificate
Most Improved Technical Division	Water Resources Engineering Technical Division	lr. Dr Wong Wai Sam	Certificate & Appreciation Meal
2nd Runners Up / 3rd Placing	Geotechnical Engineering Technical Division	Ir. Sin Peng Tean	Certificate & Appreciation Lunch
1st Runners Up / 2nd Placing	Civil and Structural Engineering Technical Division	Dr Ng Soon Ching	Certificate & Appreciation Dinner
Champion	Electrical Engineering Technical Division	lr. Yau Chau Fong	Certificate, Trophy & Appreciation Dinner

#### MOST SUPPORTIVE AWARD

TYPE OF AWARD	ORGANISATION	PERSON RECEIVED AWARD
Graduate Membership for Individual Category		Ir. Dr Khoo Hui Ling
Graduate Membership for Organisation Category	Petroliam Nasional Berhad	YM Raja Iskandar Arifin Bin Raja Azman
Corporate Membership for Individual Category		Dr Ahmad Anuar Bin Othman
Corporate Membership for Organisation Category	Tenaga Nasional Berhad	lr. Fathullah Razzaq Ghazali
Most Active Organisation	Tenaga Nasional Berhad	Ir. Shah Nawaz Asan Gany

#### IEM CONTRIBUTION TO ENGINEERING INDUSTRY AWARD 2016

ORGANISATION	PERSON RECEIVED AWARD	AWARD FOR:
Eco World Development Group Berhad	Mr. Liew Tian Xiong, Executive Director	Property Development
Ekovest Berhad	Datuk Seri Lim Keng Cheng, Managing Director	Construction
IJM - JAKS	Mr. Wong Kim Kong, Chief Operating Officer	Water
Malaysia LNG Sdn. Bhd.	lr. Pau Kiew Huai, Chief Executive Officer	Energy
Rapid Rail Sdn. Bhd.	Y.Bhg. Dato' Ir. Zohari Sulaiman, Chief Executive Officer	Transportation

# PRESIDENTIAL ADDRESS 2017



welve months ago, I addressed you in this same auditorium in conjunction with IEM's 57th Annual General Meeting. I wish to take this opportunity to express my sincere gratitude to the IEM Council for reelecting me to the office of the President of IEM for 2017-2018. Once again, I am honoured by the trust and confidence all of you have placed upon me and I shall strive to carry out this honourable responsibility with utmost care and diligence.

I am indeed grateful to the IEM Executive Committee and Council for their support over the past year. During this period I had the opportunity to meet with many IEM members both at the headquarters and the branches. At every instance, I was overwhelmed by your co-operation, kind understanding and encouragement. For this, I wish to thank each and every one of you for your unceasing support for IEM.

This year marks the 58th Anniversary of our Institution which has grown from a humble beginning with 60 members in 1959 to more than 40,000 members today. IEM has grown both in strength and stature, and has gained the recognition both locally and internationally as a respected professional organisation. Over the last 58 years, IEM has maintained a growing membership of engineers in Malaysia with the objective of promoting professionalism amongst members of the engineering fraternity. Engineers have contributed substantially to the development of the country and are expected to continue playing a pivotal role in the future.

In my Presidential Address last year, titled "*Rejuvenation* of the Institution for Long Term Sustainability", I stated that with impending changes and development of more engineering disciplines as we forge ahead, it is important that IEM evolves and stays relevant in the ever-changing landscape of engineering. I also emphasised on the need to plan and chart a course for IEM to examine the growth in membership which is an important indicator of the sustainability of the Institution. I believe that in order to be sustainable, IEM must be inclusive in its membership and must cater to a bigger pool of different categories of engineering team members.

This paradigm shift means that IEM must be more 'INCLUSIVE' in our recruitment of new members by reaching out to a bigger membership pool rather than just continue to rely on the few traditional engineering disciplines. Understanding that there is a big pool of engineers who work in non-traditional sectors, IEM has set out to target them for membership and cater to their needs under the "Graduate" and "Companion" member grades.

It is of paramount importance that IEM should also encourage more membership from Young Engineers, Women Engineers, Engineering Technologists (as IEM Incorporated Members) and Technicians (as IEM Associate Members).

#### YOUNG ENGINEERS AND WOMEN ENGINEERS

'Graduate' Members (e.g. Young Engineers) and Women Engineers should be the main force behind the rejuvenation of the Institution for long term sustainability.

I urge all IEM Members to support the amendment of the IEM Constitution and Bylaws to accommodate 'Graduate' and 'Companion' grade Members as well as Women Engineers by allowing them to elect among themselves a total of 6 new representatives to join the 63 council members in the IEM Council. Hopefully with their participation in Council of IEM, they will be able to rejuvenate and bring new ideas to IEM to stay abreast with the current development of engineering fraternity in Malaysia.

# PRESIDENTIAL ADDRESS 2017

#### **ENGINEERING TECHNOLOGISTS AND TECHNICIANS**

In addition, I am of the firm belief that the IEM membership must be expanded to attract more engineering technologists and technicians under the membership of Incorporated Member (for engineering technologists) and Associate Member (for Engineering Technicians).

Who are categorised as engineering technologists and technicians?

An engineering technologist is a specialist dedicated to the development, design and implementation of engineering and technology. Engineering technology education is more of a broad specialised and applied engineering education. The Engineering Technologist Mobility Forum, under the International Engineering Alliance, indicates that an engineering technologist's work should have required the exercise of independent engineering judgment for manufacturing firms, product improvement, design and construction, and government agencies applying engineering principles and technical skills.

An engineering technician is primarily trained in the skills and techniques relating to a specific branch of engineering, with a practical understanding, and has general fundamental engineering concepts. He/she often assists engineers and technologists in projects as well as research and development. He/she sits between a skilled craft worker and a technologist.

In general, the work of an engineering technologist focuses on the applied and practical application of engineering principles, whereas the work of an engineer emphasises on design and analysis of complex problems based on theoretical aspects of mathematical, scientific and engineering principles. Engineers generally operate in conceptual design and product development, while technologists generally work in testing, construction, or field work.

Internationally, the Sydney Accord is an agreement acknowledging the academic equivalence of accredited engineering technology programmes in the signatory economies. The Dublin Accord is an international agreement for the recognition of engineering technician education.

Both the Sydney and Dublin Accords are analogous to the Washington Accord for engineers; the Sydney Accord is for engineering technologists, while Dublin Accord is for engineering technicians.

### INTERNATIONAL REGISTRATION OF ENGINEERING TECHNOLOGISTS AND TECHNICIANS

The **International Professional Engineers Agreement (IPEA)** is the International Professional Engineers agreement which recognises the substantial equivalency of standards establishing the competency of professional engineers for independent practice.

The Institution of Engineers Malaysia (IEM) represents Malaysia as a signatory for IPEA (previously known as the Engineers Mobility Forum (EMF)). IPEA is a multi-national agreement between engineering organisations in the member jurisdictions which creates the framework for the establishment of an international standard of competency for professional engineers, and then empowers each member organisation to establish and operate the International Professional Engineers Register in each economy.

The International Engineering Technologists Agreement (IETA) allows for the mutual recognition of the substantial equivalency of standards establishing the competency for practicing engineering technologists while the Agreement for International Engineering Technicians (AEIT) establishes an international benchmark competence standard for individuals practising as fully qualified engineering technicians.

Both IETA and AEIT aim to facilitate cross-border practice by experienced engineering technologists and engineering technicians by establishing a framework for their recognition based on confidence in the integrity of national assessment systems, secured through continuing mutual inspection and evaluation of those systems based on substantial equivalence of standards and quality assurance systems.

Currently IEM represents Malaysia as the signatory for IPEA. IEM has to work towards becoming signatories for the country for IETA and AEIT.

#### **MEMBERSHIP IN IEM**

The IEM Incorporated Membership Grade category caters to Engineering Technologists while the Associate Membership category caters to Engineering Technicians. There are, at present, 81 and 37 members respectively in the Incorporated and Associate Member categories.

66 We are trying to construct a more inclusive society. We are going to make a society in which no one is left out.

Franklin D. Roosevelt, American statesman and 32nd President of the United States



In light of this, we must do more to promote membership among Engineering Technologists and Technicians. To this end, IEM needs to amend its Constitution and By-Laws to have a more explicit way to define Engineering Technologists and Technicians.

We truly believe that, for the advancement of their careers, Engineering Technologists and Technicians who join as members, will benefit from all the activities and networking opportunities available in IEM.

#### **IEM IN INTERNATIONAL ARENA**

In the International arena, IEM has emerged as the leading player in the engineering fraternity, especially in the ASEAN and Asia Pacific region. IEM has well positioned itself as the leading player in the ASEAN Federation of Engineering Organisations (AFEO) and the Federation of Engineering Institutions of Asia and the Pacific (FEIAP) where IEM is the permanent Secretariat of both AFEO and FEIAP and holds

# PRESIDENTIAL ADDRESS 2017

the position of Secretary General of both AFEO and FEIAP. Currently, FEIAP is working closely with UNESCO on a project to strengthen and upgrade the quality of engineering education and to enable mobility of engineers between Asia, the Pacific region and Africa.

I am proud that IEM is well represented internationally in World Federation of Engineering Organisation (WFEO), Commonwealth Engineers Council (CEC), The Federation of Engineering Institutions of Islamic Countries (FEIIC), the APEC Engineer Coordinating Committee and Asian Pacific Confederation of Chemical Engineering (APCChe). IEM's flag flies high and proud internationally because of the untiring efforts of the committee members and volunteers who represent IEM in these organisations.

#### **PROMOTING STEM EDUCATION**

IEM is concerned over the decline in the number of secondary school students taking up Science, Technology, Engineering and Mathematics (STEM) subjects. Currently, less than 30% of Form 4 students are in the science stream compared to 50% many years ago while Malaysia is targeting for 60%.

According to the World Economic Forum 2016, 80% of jobs in the future will require some form of STEM background or education. By 2020, it is predicted that some 2 million jobs created worldwide will be related to the fields of Computer, Mathematics and Engineering. Malaysia cannot afford to be left behind.

It is imperative for IEM to promote the career paths of engineers, engineering technologists and engineering technicians to the general public, parents and schoolchildren. If we do not have a big pool of students doing STEM in Forms 4 and 5, the number of students doing engineering in universities will certainly drop and this does not augur well for a developing nation like ours which needs many more engineers. In this respect, IEM has taken the initiative to join forces with universities and other professional bodies to promote STEM education. For example, IEM has been part of the organising team for the Kuala Lumpur Engineering and Science Fair (KLESF) for the last 3 years. In early November 2016, the KLESF attracted more than 55,000 visitors during the 3-day fair.

#### CONCLUSION

In conclusion, IEM cannot afford to be complacent and remain status quo in ways and methods which worked in the past to attract new members and maintaining existing members. We must find innovative ways to cater to a wider range of membership from Young Engineers, Women Engineers, Engineering Technologists and Engineering Technicians by making them feel needed, appreciated and important, as well as giving them a better platform to perform and helping them advance in their careers.

In closing, I wish to thank all of you for the trust you have placed in me and the incoming Council. We must work hard and innovatively for this effort to make IEM an "Inclusive" institution so that IEM can be sustainable in the institutional growth and for the Institution to be truly representing not only all engineers but the whole engineering fraternity.



Malala Yousafzai Activist for Education and youngest-ever Nobel Prize laureate



# CAFEO 34 at an Island Paradise



lr. Dr Leong Wai Yie

The annual Conference of ASEAN Federation of Engineering Organisation (CAFEO 34) was organised by the Philippine Technological Council (PTC) and held at a hotel in Puerto Princesa, Palawan, in the Philippines from 21-24 November 2016. Palawan is an archipelagic province of the Philippines, located in the Mimaropa region.



Asean handshake at the AFEO Board Meeting and after Palawan Declaration Signing Ceremony

The theme was "ASEAN Community: Engineering Shining Through". The Philippines held the chair of AFEO for 2016 until the conclusion of CAFEO 34.

CAFEO 34 attracted more than 1,000 delegates from ASEAN and the Asia Pacific region, the World Federation of Engineering Organisations (WFEO), ASEAN Academy of Engineering and Technology (AAET) and The Federation of Engineering Institutions of Asia and the Pacific (FEIAP).

# PRE-CONFERENCE ACTIVITIES (20 NOVEMBER 2016, SUNDAY)

On the eve of CAFEO 34, some of the delegates played friendly games of golf in the early morning. However, the 9-hole golf course was not suitable for a competitive event.

CAFEO, WEAFEO and YEAFEO delegates embraced a greener lifestyle while learning more about the natural environment of the tourism island of Palawan. WEAFEO and YEAFEO delegations joined the Underground River Tour, and explored the magnificent Underground River and its natural wonders; this was the winner of The 2011 New 7 Wonders of Nature in the World. Some CAFEO delegates joined a day-trip to Honda Bay Islands on island hopping tours that visited Lu-li, Starfish and Cowrie islands.

# MEETINGS IN SESSION (21 NOVEMBER 2016, MONDAY)

During the conference, the hotel was buzzing with working

groups, workshops, technical seminars, country reports, discussions and forums taking place in parallel sessions.

IEM (Malaysia) chaired the Energy Work Group while Environment Work Group was chaired by PUJA (Brunei), Education and Capacity Building by IES (Singapore), Transportation & Logistics and Disaster Support by EIT (Thailand), Smart and Sustainable Cities Work Group by IES (Singapore) and Adhoc Committee Mobility of Engineers in ASEAN by PTC (Philippines).

Women engineer issues within the ASEAN countries were also discussed. The day ended with the ASEAN Engineers Register Commission Meeting in the evening.

#### WELCOMING RECEPTION & ASEAN ENGINEERING REGISTER CONFERMENT (21 NOVEMBER 2016, MONDAY)

The Welcoming Reception, held a day before the opening ceremony, allowed more than 1,000 delegates from ASEAN and Asia Pacific countries to meet, network and get to know each other. It was well attended with plenty of local cuisine and drinks for everyone.

The organising chairman of CAFEO 34 and PTC Vice President for External Affairs, Engr. Cezar S. De La Cruz, welcomed the participants, and said they should put the spirit of friendship, cooperation and harmony in their hearts and minds to make the event a fruitful experience for everyone. It was PTC's hope that the delegates



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could learn from the technical and plenary sessions and establish networks for the benefit of the ASEAN Economic Community.

In his speech, the Chairman of AFEO and President of PTC, Hon. AFEO Federico A. Monsada, said that the theme of CAFEO 34 spoke well of the direction AFEO should be heading and that engineering professionals should continue to pave the path and move forward into the global market.

In the bigger Integrated ASEAN community, engineering is challenged to surpass its own performances which traditionally, had been limited by national boundaries. AFEO and its partners, such as FEIAP, have continued engineering's prominence and leadership, thereby sustaining their contributions to the peace and prosperity objectives of the ASEAN.

The ASEAN Engineering Register was the highlight of the evening's event, with AER certification being presented to 412 ASEAN engineers, technologists, technicians and related associates.

#### WORKING GROUPS AND MEETINGS (21-23 NOVEMBER 2016)

The Working Groups met to look into various issues affecting the ASEAN countries.

- Sustainable Cities Work Group chaired by The Institution of Engineers, Singapore (IES), discussed the integration of city-wide systemic responses to innovate and optimise existing resources, to harness the potentialities of the sustainable future and to steer the emerging futures of the cities to a sustainable, prosperous path.
- Mobility of Engineers Forum chaired by Philippines Technological Council (PTC) emphasised on the AFEO/ AER database and directory for engineering expertise, education system, common engineering terms and engineering practices and standards.
- Energy chaired by The Institution of Engineers, Malaysia (IEM) highlighted the ASEAN Green Energy white paper, AFEO Energy Technical Visit, energy expert directory and AEI guidelines on electrical installation.
- Environmental Engineering Work Group chaired by Pertubuhan Ukur, Jurutera dan Akitek, Brunei (PUJA), touched on generating energy from waste as well as transboundary haze and pollution issues.
- 5. Education and Capacity Building chaired by The Institution of Engineers, Singapore (IES) looked into the collection of information on education systems in ASEAN countries and CPD implementation.
- 6. Transportation and Logistic chaired by The Engineering Institute of Thailand (EIT) discussed the collaboration with MIROS and ARSC. Reports on the ASEAN transportation structure maintenance culture and best practices were also presented.
- 7. Disaster Preparedness, Mitigation and Management Work Group - chaired by The Engineering Institute of Thailand (EIT) touched on disasters that struck ASEAN countries in 2016 as well as the impact and emergency preparedness. It was generally opined that most ASEAN countries were not prepared for disasters but would take good remedial action in time of disasters.

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#### DAY 2 (22 NOVEMBER, 2016, TUESDAY)

YEAFEO (Young Engineers of the ASEAN Federation of Engineering Organisations): The Young Engineers Section (YES) attended the YEAFEO meeting with young engineers of other countries. The representative of each country gave a short country briefing, focusing on the development of students and graduate engineers.

This year, young engineers from Taiwan and Japan also participated in YEAFEO. The meeting was a success and there were many discussions on continuing to help the development of young engineers in the region.

On the third day of CAFEO 34 (23 November), representatives from the Philippines organised a team building event at the swimming pool area, attended by some 40 delegates.

## WEAFEO (WOMEN ENGINEERS OF THE ASEAN FEDERATION OF ENGINEERING ORGANISATIONS)

Members from ASEAN countries discussed regional collaboration, research funding and future networking. All country representatives presented their annual activity reports and plans. There were many discussions on enhancing the mobility of women engineers in ASEAN. Women engineers will continue to be involved in the 3rd WEAFEO Summit in Thailand next year.

Malaysia will be bidding for the International Conference on Women in Engineering and Science in 2020. The Philippines would be hosting the 2nd Women Summit 2017, while Singapore was encouraged to help ASEAN women engineers host International Women Day in March. WEAFEO delegates were invited to the 2nd Women Engineers Summit to highlight outstanding achievements of WEAFEO in Science, Technology, Engineering and Mathematics (STEM).

The invited keynote addresses were presented by Ir. Leong Wai Yie (Malaysia), Dr May Rose C. Imperial (Philippines), Dr Evelyn Dofredo (Philippines) and Engr. Lea. N. Delfinado (Philippines). The moderator was Engr. Estrellita Bordallo from PTC.

#### **ASEAN AWARD MEETING**

This event was chaired by the Deputy President of The Institution of Engineers, Malaysia (IEM). The Awards Committee nominates and recognises outstanding projects and associated engineers from the region. This year, there were 13 nominees for the Engineering Achievement Project Award, 4 for the Engineering Achievement Individual Award, 1 for Honorary Patron, 7 for Distinguished Honorary Fellow, 34 for Honorary Fellows and 42 for Honorary Members.

#### **OPENING CEREMONY (22 NOVEMBER 2016, TUESDAY)**

The Mayor of Puerto Princesa, Mr. Lucilo R Bayron, officiated at the Grand Opening Ceremony. He welcomed the delegates to Palawan and hoped that the conference would open an avenue to lead the engineering profession to champion professionalism and academic excellence. Through the exchange of information, AFEO would discover novel ideas, solutions and knowledge that could reinforce the current capacity to design and build efficient infrastructures in the fields of construction, transportation and logistics.

Following the opening ceremony, country reports from each of the AFEO member organisations were presented by the respective Presidents or Heads of member organisations.

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AFEO award, was conferred on the former President of the Philippines, His Excellency Fidel V. Ramos.

The following received the Distinguished Honorary fellows: Minister in the Prime Minister's Department Malaysia Datuk Ir. Dr Wee Ka Siong, Minister of Public Works and Housing, Republic of Indonesia Dr Ir. Mohamad Basoeki Hadimoeljono, Cabinet Secretary (Minister) Department of Energy of Philipines Zenaida Ygnacio Monsada, Cabinet Secretary (Minister) Department of Science and Technology (DOST) of Philippines Fortunato Tanseco de la Peña, Union Minister, Ministry of Construction, The Republic of the Union of Myanmar and Patron of Myanmar Engineering Council HE U Win Khaing, Minister of Posts and Telecommunications, Cambodia HE Tram Iv Tek, Executive Director, Operation Director and Chairman of Technical Committee on Distance Education via Satellite Foundation of Thailand and Director of National Space Policy Committee of Thailand Assoc. Prof. Dr Suthi Aksornkitti.

#### **TECHNICAL SESSIONS OF THE CONFERENCE**

CAFEO 34 provided the opportunity to share and exchange experiences and expertise as well as to create awareness and understanding of recent developments and trends in the field of engineering and technology in ASEAN. In total, there were 33 technical papers, including papers from keynote speakers and invited speakers.

#### FEIAP EXCO MEETING

Besides the conference sessions, the working group meetings and ASEAN Engineering Register Commission meeting, the Federation of Engineering Institution of Asia and the Pacific (FEIAP) also held its Exco meetings in conjunction with CAFEO 34. The Young Engineers of AFEO (YEAFEO) and Woman Engineers of AFEO (WE-AFEO) meetings also went on as scheduled. All findings and proposals from the meetings were presented to the AFEO Governing Board which summed up the activities on 23 November 2016. The Board members then signed the Palawan Declaration after the Board meeting, followed by the exchange of tokens of appreciation and photography sessions.

#### AFEO BOARD MEETING (23 NOVEMBER 2016)

The AFEO Board meeting discussed reports by AFEO Awards Committee, AER Head Commissioner, AFEO Working Groups, YEAFEO, WEAFEO, AFEO 2017 budget and Election of Chairman and Vice Chairman of AFEO Governing Board 2017.



AFEO Board Meeting in Session

#### CLOSING CEREMONY (23 NOVEMBER 2016)

The CAFEO 34 Closing Banquet was attended by over 1,200 delegates, fellow engineers, distinguished local guests and those from ASEAN and other parts of the world. There were activities such as the presentation of AFEO Engineering Achievement Awards for best engineering projects, feats and well-known or eminent individuals from ASEAN countries.





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	List of Awards at Cafeo 34 – AFEO Winners (Malaysia)
AFEO Distinguished Hon Fellow	Ir. Dr Wee Ka Siong, Minister in the Prime Minister's Department Malaysia
AFEO Hon Fellow	Dato Ir. Lim Chow Hock, AFEO Immediate Past Chairman & IEM Immediate Past President
	Ir. Lee Weng Onn, IEM Country Registrar 2015 and IEM Vice President (Upgrade from Hon Member)
	Ir. Lee Boon Chong, IEM Vice President (Upgrade from Hon. Member)
	Ir. Prof. Dr Ruslan bin Hassan, IEM Vice President (Upgrade from Hon. Member)
	Ir. Lai Sze Ching IEM Vice President
	Ir. Ong Sang Woh, Ex-Excomm Member
AFEO Hon	Ir. Kim Kek Seong, Ex-Excomm Member
Member	Assoc. Prof. Ir. Dr Norlida binti Buniyamin, Excomm member and Vice President Southern Branch
	Ir. Assoc. Prof. Hayati binti Abdullah, Southern Branch Chairperson and Ex- Excomm member
	Ir. Fam Yew Hin, METD Chairman
	Ir. Dr Tan Chee Fai, Melaka Branch Chairman and Excomm member
	Ir. Ellias bin Saidin, IEM Vice President, AER Head Commissioner

Outstanding engineers and eminent personalities were also conferred honorary titles. These were followed by cultural performances, singing and dancing, with special performances by CAFEO delegates, women engineers and young engineers from the various countries.

The handover ceremony was also held during the Grand Gala Dinner. By rotation, after the Philippines, it now falls on Thailand to hold the AFEO Chair and to host CAFEO 35 in 2017. To mark the end of CAFEO 34, PTC President Engr. Fred Monsada handed the AFEO flag to the Engineering Institute of Thailand (EIT), which was represented by Assoc. Prof. Dr Suttisak Soralump, the Head of EIT delegation and Organising Chairman for CAFEO 35.

The event carried on with lots of singing and dancing, marking and celebrating yet another successful conference.

#### **EXHIBITION BOOTHS AND MINI BAZAAR**

Break times provided respite from the serious business of the day and gave delegates time to network and catch up with colleagues and peers. The exhibition booths and a mini-bazaar added interaction and allowed spouses and delegates to go on a shopping spree.

#### **CAFEO 35 IN BANGKOK, THAILAND**

The President of PTC, Hon. AFEO Federico A. Monsada, thanked all AFEO heads of delegation for their enthusiastic participation. He also expressed his gratitude to the generous sponsors, without whom CAFEO 34 would not have achieved such great success.

"Thank you very much and see you all at CAFEO 35 in Bangkok, Thailand," he said in closing. As had been the practice for a while now, CAFEO 34 also afforded priority to young engineers and women engineers from the region, providing them with a platform for establishing rapport for future engineering activities and collaborations.

#### **Authors' Biodata**

*Ir. Dr Leong Wai Yie,* is currently the Chairman of Women Engineers Section. She is involved in biomedical signal processing analysis and wireless communications.

Kok Jing Shun, is currently the Chairman of Young Engineers Section. He is a senior mechanical engineer at Duriane Consult.



# Life Cost Analysis and Cost Effectiveness Ratio Determination of Gross Pollutant Trap for Urban River Catchment





Lariyah Mohd

Sidek



Hidayah Basri

The growing population and migration towards built areas are driving land use change in the form of urbanisation across the globe. By 2050, some 70% of the world's population are expected to live in urban areas. Although this process leads to improvement of socio economic life in one area, urbanisation also brings along a wide range of challenges to the environment. As urbanisation often relates to deterioration of stormwater quality due to factors such as uncontrolled pollution and waste disposal, the management of water quality impacts in urban areas must be addressed in order to protect our environment.

Pollutants carried by urban stormwater runoff are considered a significant contributor to the degradation of receiving waters. In Malaysia, gross pollutants such as litter, debris and sediments are some of the main causes of river pollution and flooding. As a result, there is widespread degradation of rivers, which is often the source of the flooding problems (Lariyah, 2011). Accumulation of gross pollutants results in the blockage of drainage systems which also leads to degradation of receiving water quality despite the flooding problem. Accumulated pollutants are not only aesthetically unattractive but they also demonstrate environmentally threatening and devastating effects to the natural equilibrium as well as impede the hydraulic performance of the urban drainage system (Ghani, 2011).

According to statistics from Dewan Bandaraya Kuala Lumpur (DBKL), the government paid RM80 per tonne of rubbish for cleaning and dumping at Bukit Tagar landfill area (Bernama, 2013). However, the cost of cleaning up rubbish in water bodies is more costly as this involves trapping mechanisms (The Star Online, 2017).

## INITIATIVE TO REDUCE GROSS POLLUTANTS IN URBAN WATERWAYS

The Department of Irrigation & Drainage (2012) addressed the treatment methods to control gross pollutants in Chapter 10 MSMA 2nd Edition by installing Gross Pollutant Traps (GPT) at the downstream end of drains or engineered waterways. The introduction of GPT as a pre-treatment for stormwater flow is an excellent method to reduce and handle gross pollutants before the water enters ponds, wetlands and rivers.



Rubbish trapped at a log boom in Batu River, Selangor (Source: The Star Online, 2017)

GPTs are designed to remove litter, debris and sediment from stormwater. Some are even designed to filter oil and to remove chemical from the water flow. Today, there are a number of devices, including conventional and proprietary GPTs, for trapping gross pollutants, which are based on initially diverting stormwater to a separation and retention chamber in which these pollutants are subjected to the mechanisms of interception and sedimentation (Wong & Wootton, 1995; Allison *et al.*, (1998); Walker *et al.*, (1999)). The diversion device allows stormwater to by-pass the separation chamber in the event of blockage due to excessive accumulation of gross pollutants in the chamber during the designed events.

There are now various devices with different trapping mechanisms available in the market. The authorities have made efforts to install GPTs to trap gross pollutants before the water enters the river system. It has been proven in many studies that these devices are able to significantly reduce the amount of gross pollutants. It is also important to note that, with periodic and proper maintenance, these devices will function well (DID, 2012).

	MSMA 2 <sup>nd</sup> Edition, 2012   DID N	Aalavsia
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Chapter 10 of Urban Stormwater Management Manual (MSMA) on GPT

#### **RIVER OF LIFE PROJECT**

In the effort to solve river pollution issues, major investments have been made through the River of Life (ROL) project to improve river water quality. Structural and non-structural measures include the construction of new sewage treatment plants, refurbishment of old ones, installation of gross pollutant traps and construction of river water treatment plants and detention ponds as suggested in Integrated River Basin Management (IRBM).

ROL is a long-term programme to rehabilitate and provide an adequate level of flood protection in the Klang River catchment. It involves improving water quality, beautifying the river and creating conducive working/ living conditions along its banks. ROL is a key component of the Economic Transformation Programme (ETP) initiated by the government to transform the Klang River into a vibrant and liveable waterfront with high economic value.



Construction of detention ponds to trap sediments





Installation of GPT

Beefing up enforcement



Construction and refurbishment of sewage treatment plants



on of GPT Beefing up enforcement Education & Public Outreach Structural and non-structural measure for River Cleaning Components

The ROL project area is located at the Sg. Klang catchment area. Main tributaries in the catchment are Sungai Klang (upper catchment), Sungai Gombak, Sungai Batu, Sungai Jinjang, Sungai Keroh, Sungai Bunus, Sungai Ampang and Sungai Kerayong.









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ROL Project Area

#### **GROSS POLLUTANT TRAP**

When used in connection with stormwater drainage systems, the term "gross pollutant" may include litter, debris and coarse sediments (Fitzgerald, 2010). Studies and rationality of daily activities indicate that a significant proportion of gross pollutants discharged into waterways are generated from residential land, as this type of development constitutes a significant proportion of the land use in most catchments (Land Development Guidelines, 2007).

Each type of GPT has a control mechanism for the flow rate that passes through, by filtering and capturing gross pollutants such as silt and sediment which have been transported from upstream to downstream. The selection number of GPTs for each catchment area is essential to ensure that flow rates are under control and treatable, especially during high rainfall intensity. An inadequate number of GPTs or unsuitable types of GPT installed will result in inefficiency when treating the flow.

The important role of GPTs in stormwater management also depends on land usage. A study by Allison and Chiew (1995) of a fully urbanised area in Coburg catchment shows variability of the composition of gross pollutants with different types of land use.

#### RESEARCH & DEVELOPMENT TO SUPPORT ROL PROJECT

The implementation of river cleaning component utilises water treatment technologies to improve water quality in the ROL project. Among these are using of river treatment methods to control gross pollutants, as suggested in Chapter 10 MSMA 2nd Edition. Installation of GPTs are among the structural measures under Key Initiatives 4A and 7 to clean and improve a 110km stretch along the Klang River basin, from the current Class III-V to Class IIB by 2020. To date, there are 528 units of GPTs installed in the project area.

The performance of a GPT depends strongly upon the specific site criteria, such as land use, hydrological regime and maintenance frequency. As maintenance cost is significant in the life-cycle cost of GPTs, the local authority faces issues of conducting proper maintenance frequency for installed GPTs, resulting in system clogging which, in turn, leads to flooding and contamination of water in the downstream area. In view of this, UNITEN R&D Sdn. Bhd. has been entrusted by DID Malaysia to carry out research on the performance of proprietary Gross Pollutant Trap (GPT) trapping devices versus life-cycle cost and gross pollutant management strategies knowledge database for the ROL project.

The study involves field activities such as sorting gross pollutants, measuring wet loads during GPT maintenance and analysing the performance of GPTs to remove the gross pollutants. The research purpose is to investigate the characteristics of gross pollutants derived from urban drainage, which is obtained from GPT operation and maintenance. It also aims to measure the performance of gross pollutant traps installed in the study in terms of trapping various types of gross pollutants and improving water quality. Finally, the data obtained will assist engineers and local authorities to implement appropriate strategies for trapping gross pollutants in urban areas, expand the sources for managing gross pollutants in order to rehabilitate the river system and preparing budget allocation of using GPTs in terms of installation cost and maintenance cost annually, including the Life-Cycle Cost analysis. The ultimate aim is to provide a management and planning tool for effective management of the gross pollutants in the urban areas, specifically in the River of Life (ROL) project.



Different Types of GPT in ROL Project

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#### **GPT MAINTENANCE & MONITORING**

This study consists of monitoring and assessing gross pollutant traps for 5 types of proprietary GPTs from 3 different types of land use (residential, commercial and mixed development) at Sg. Klang, Sg. Gisir, Sg. Sering, Sg. Kemensah and Sg. Keravona.

The data collection process was divided into desktop data collection and field data collection. Desktop data collection involved gathering of hydrological data, GPT inventory database, GIS mapping as well as operation and maintenance cost data. For field data collection, there were three on-site activities involved: Weighing of gross pollutant wet load trapped in GPT, sorting gross pollutant and sampling water quality at selected locations. All data and information were finally incorporated into the gross pollutant management strategies database.



Maintenance of GPT: Suction Truck

Maintenance of GPT: Manual



Crane

Data Collection Activities during GPT Maintenance

#### **ESTIMATION OF LIFE-CYCLE COST ANALYSIS AND** COST EFFECTIVENESS RATIO

The data on estimated life-cycle cost (LCC) of GPT costina was obtained from PLSK. The data included installation cost, inspection cost and cleaning cost. The LCC for each trap was calculated using the appropriate Australian Standard (AS/NZS 4536, 1999). This process used Excel spreadsheet to calculate the LCC. The life duration of the GPTs was based on 10 years and 40 years, as recommended from a previous study (Brisbane City Council. 2002).

The LCC for all GPTs in the study area was analysed. The analysis included Equivalent Annual Cost (EAC) derived from the life-cycle cost, based on different project durations of 10 and 40 years, based on the literature review. The analysis assumed that maintenance was performed monthly on all GPTs.

From the analysis, the LCC of GPTs in the study area ranged from RM157,750 to RM297,086 for a duration of 10 years. However, for a duration of 40 years, the LCC ranged from RM315,358 to RM616,694. The main factors contributing to the LCC value are maintenance frequency and maintenance method.

The study shows that manual maintenance (using manpower to remove rubbish from GPT) has the lowest LCC value of RM157,750. The second lowest LCC is using a suction truck, while the highest LCC is using a crane. For this method, at least two vehicles (crane and lorry) are required to transport the gross pollutants to the dumping area. This explains the higher LCC for this type of maintenance. It is also important to note that more frequent maintenance will increase the total life-cycle cost. Therefore, to decide on the maintenance frequency of GPTs, it is important to first identify the total loading from each catchment. Table 1 shows the maintenance method conducted during the maintenance activities in the study areas.

Table 1. LCC and EAC of GP is for the frequency of Monthly Mai	ntenance

Maintenance	LCC	(RM)	EAC (R	M/year)
Method	10 years	40 years	10 years	40 years
Manual	157,750.00	315,358.50	15,775.05	7,883.96
	163,054	387,712	16,305.40	9,692.80
Suction Truck	to	to	to	to
	270,686	511,094	27,068.60	12,777.35
Crane	297,086	616,694	29,708.60	15,417.35

The important criterion in assessing the performance of GPTs is the cost analysis. The analysis involved is quantifying the value for money for each device, using the "Cost Effectiveness Ratio" analytical technique (9). The Cost Effectiveness Ratio (CER) takes into account the life-cycle cost and pollutant removal efficiency. The important advantage is that CER provides a simple tool for assessing management options for pollution trap operations.

The CER for all 151 GPTs in the study area was calculated and it was found that more than 50% of proprietary GPTs in the study area have a CER of between RM1,001 and RM10,000. Another 30% have a CER value less than RM1,000, while only 11% have a CER of more than RM10,000. In general, a device with the lowest CER is preferred. (10)



Percentage of GPTs with Different Range of Cost Effectiveness Ratio

#### GPT STRATEGIES KNOWLEDGE DATABASE SYSTEM

The Gross Pollutant Management Strategies Database was developed based on previous and current research and collection of data which would complement the system as a data storage hub. The system provided a database for monitoring data collected and performance analysis results. System architecture was also designed based on a scalable and extensible platform which could be easily extended and configured to meet the progressive needs of supporting delivery of services across multiple platforms, including desktop, server, web and mobile developed by **DID & UNITEN.** 



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#### **ROL PUBLIC OUTREACH PROGRAMME**

Apart from the installation of GPTs as a structural measure to reduce the amount of gross pollutants, there are nonstructural methods which basically focus on public attitudes through monitoring and law enforcement. FHWA (2002) describes non-structural Best Management Practices (BMPs) as an "at-source approach" to prevent and remove stormwater constituents load. Stormwater non-structural BMPs may be among the most cost-effective solutions to reduce constituents in stormwater runoff.

The River of Life Public Outreach Programme (ROL-POP) is an initiative under the National Key Economic Area (NKEA) and undertaken by the Department of Irrigation and Drainage (DID) Malaysia. The programme was initially started at the Upper Sg. Klang catchment. ROL-POP is a non-structural measure to foster partnerships and to improve the attitude and behaviour of target groups so as to reduce pollution.

It aims to formulate an effective public awareness programme to inculcate and raise general public awareness and understanding of Greater KL as well as to formulate a suitable public participation mechanism and platform to encourage and ensure effective public stakeholders' participation. An outreach programme is not an isolated set of activities. The ROL-POP is an on-going cumulative process, starting at the roots of awareness, participation, action and ownership. It involves different water user groups including communities, NGOs, private sectors, polluters and water-sector service providers.



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No. 2, Jalan Jemuju Dua, 16/13B, Section 16, 40200 Shah Alam, Selangor, Malaysia. Tel: +603 5523 8989 Fax: +603 5524 1010 Email: info@globalpowertest.com Website: www.globalpowertest.com Many ROL-POP activities involve universities and institutions of higher learning, either through awareness creation, public engagement or voluntary participation in events and river care programmes. This key group is seen as agents of change and important stakeholders to ensure that ROL programmes are sustainable and will continue to benefit society as a whole, through continued activism by those who have benefited from it.

The increase in population density, built-up areas, industrialisation and seasonal variation can directly or indirectly affect the hydrological processes through the alteration of flow characteristics, stream-flow regime and changes in river amenities (Y. Liu, 2014).

Education will increase public awareness of the impact of pollution on the environment. Law enforcement on littering also promotes the reduction of gross pollutants. Fundamental elements towards the successful implementation of non-structural methods are positive participation and the involvement of individuals, communities and government/private agencies.

The ROL-POP programme was initially started at the Upper Sg. Klang catchment. In this study, the annual gross pollutant load captured here was compared with that from the Sg. Kerayong catchment (Table 2). The result indicates a 60% difference for the annual gross pollutant load between Upper Sg. Klang and Sg. Kerayong catchments. This shows the success of the Public Outreach Programme conducted at Sg. Klang.

Table 2: Reduction of Annual Average Wet Load at POP project area located at Upper Sg. Klang

Maintenance Metho	bd	Total Wet Load (kg/ha/year/GPT)
Upper Sg. Klang (with (Sg. Klang, Sg. Kemen	POP) sah, Sg. Sering, Sg. Gisir)	143.19
Sg. Kerayong (without (Sg. Kerayong 1, Sg. Ke	POP) erayong 2)	397.585

#### OUTCOME R&D PROJECT FOR GROSS POLLUTANT TRAPS (GPT) UNDER ROL PROJECT

- 1. Gross pollutant generation rate based on different type of land use and population.
- 2. Estimation of gross pollutant load for different catchment characteristic.
- 3. Optimum number of gross pollutant traps in each catchment.
- 4. Provide GPT performance in monitoring gross pollutant to contribute and featured in the next updated MSMA Manual.
- 5. Updated Gross Pollutant Management Strategies Knowledge Database.
- 6. GPT knowledge database system that will assist the DID and designers to monitor GPT's and provides complete inventory database of Proprietary GPTs in study area.
- 7. Estimation of LCC and EAC which is helpful for the DID to allocate sufficient budget for future operation and maintenance of GPTs.

#### CONCLUSION

From this study, the calculated life-cycle cost and cost effectiveness ratio will be used for the selection of trapping mechanisms to ensure the sustainability of the environment. Continuous research and development activities by the implementing agencies and university will contribute to the success of the ROL project. To ensure the effective management of gross pollutants, the following suggestions are recommended:

- Implementation of the non-structural method (as recommended by MSMA) through public awareness regarding the importance of preserving nature and avoiding pollutants shall be actively done by all parties involved, to reduce the amount of debris produced.
- Education through the mass media, seminars and courses for the young generation to preserve nature and environment.
- Local authorities should be more proactive in implementing the necessary acts and regulations to sustain the quality of environment.

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#### **ACKNOWLEDGEMENTS**

Our appreciation goes to the Department of Irrigation and Drainage (DID), Humid Tropic Centre Kuala Lumpur (HTC KL), Pejabat Lembangan Sungai Klang (PLSK) and various other parties involved for their endless efforts and assistance in providing details and information towards accomplishing this project.

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#### **IEM DIARY OF EVENTS**

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#### 19 May 2017

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Organised by	: Environmental Engineering Technical Division
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#### 20 May 2017

Organised by	: Environmental Engineering Technical Division
Time	: 9.00 a.m 11.00 a.m.
CPD/PDP	: 2

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# **Tribute to Dato' Ir. Kam U-Tee** The Man Who Contributed to the **Success of Penang** Water Authority





n 1994, a Fellow of The Institution of Engineers, Malaysia (IEM) and a past Chairman of the Northern Branch, received the inaugural Manager of the Year Award from the Malavsian Water Association (MWA) "for his contributions to total management efficiencies in the waterworks industry particularly on improvements to commercial aspects such as computerised billing systems, revenue collection as well as innovations such as joint collection centres for multiple authority bills and management information systems".

Also known to Penangites as the "Waterman of Penang", Dato' Ir. Kam U-Tee also received the Distinguished Engineer Award from the Penang Branch of IEM in 2009.

Dato' Kam was born on 26 February, 1931 and lived through the Great Depression as well as the Second World War. He said images of poverty and the suffering of the poor in Indonesia, where his family was stranded, were deeply embedded in his memory and helped to shape his career. When he became a water engineer, his greatest concern was to ensure people from all walks of life had access to water at an affordable price, with the capacity for self-financed growth.

He graduated in Civil Engineering from the University of Melbourne, Australia, in 1956. After working for one year at the Country Road Board of Victoria as an assistant bridge design engineer, he returned to Penang to work as Assistant Resident Engineer for the construction of Air Itam Dam, the first earth dam in the country, for three years. He was then appointed Resident Engineer for the Air Itam Dam Treatment Plant. The plant, which produced 55 million litres (12 million gallons) of water a day, was designed by the then City Water Engineer, Ir. Goh Heng Chong, one of the pioneer engineers in the country. It had an innovative design and locally fabricated mechanisms such as filter control consoles and chemical dosing equipment.

Upon the completion of the treatment plant, Dato' Kam was appointed Assistant City Water Engineer, City Council of Georgetown, Penang. In 1968, he was appointed City Water Engineer in charge of water supply for the island (excluding Balik Pulau and Penang Hill). In 1973, when Penang Water Authority (Pihak Berkuasa Air Pulau Penang or PBA) was formed to manage water supply for the entire state, he was appointed its Deputy Chairman and General Manager. He retired in 1990 at the age of 59.

As its chief executive officer Dato' Kam contributed immensely to the success of PBA, which is still recognised as one of the leading water supply organisations in Malaysia - supplying the cheapest water with the widest coverage, minimum Non-Revenue Water (NRW) and the highest revenue collection efficiency.

He instituted measures to upgrade the water supply system and enhance the overall performance of PBA. These included the development of the first successful computerised water billing and collection system in the country and the formation of a Joint Collection System involving local councils and the National Electricity Board.

To tackle the perennial problem of NRW, Dato' Kam considered its losses as comprising two components:

- 1. Physical losses the transmission losses in the water distribution systems before reaching consumer premises.
- 2. Commercial losses losses sustained by under-recording of meters, under-reading, under-billing and nonpayment of bills.

He was of the opinion that an incremental approach should be taken to reduce NRW, with priority given to reducing commercial losses followed by measures to improve distribution systems.

The innovative design with appropriate technology of Ir. Goh Heng Chong, who laid the foundation to put PBA in good stead to be a successful water supply organisation, influenced Dato' Kam's approach to problems for the

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rest of his career. Innovative methods were used in the implementation of water projects. Upgrading of water treatment plants to increase water treatment capacities was carried out by improving operational parameters, thus achieving savings in space and chemicals. A 45 million litres (10 million gallons) rectangular reinforced concrete service reservoir (85mx79mx9m or 280ftx260ftx30ft) was designed by considering the reservoir wall as a propped cantilever with pre-stressing tendons carried through the reservoir roof. Ferrocement (also called thin-shell concrete) instead of conventional reinforced concrete was used to construct a small water intake and a 900,000-litre (200,000-gallon) water tank at difficult site conditions. The tank has a shape of an inverted umbrella with a small base and increased diameter at the top on an inverted cone. In the design of a 1400mm-diameter mild steel pipeline, the stiffness of concrete lining of the pipe was taken into consideration in its resistance to deflection due to external loading.

Upon his retirement, Dato' Kam worked as an independent waterworks consultant, specialising in mainly in management reviews and the upgrading of water works in Malaysia and neighbouring countries.

He was appointed a short-term consultant by the World Bank, Asian Development Bank and USAID, to review waterworks in Pakistan, Sri Lanka, Vietnam, Laos and the Philippines.

He served as advisory consultant in several local companies in making studies for proposals for projects in China, Philippines, Indonesia, West Indies and Papua New Guinea.

As design consultant for turnkey projects, he completed the upgrading of 13 water treatment plants in Kedah, Perak and Penang.

Based on his vast practical experience, Dato' Kam developed a Patent: An Improved Hydraulic Flocculation System for Water Treatment Plant. His invention provides for an efficient toroidal recirculation environment for flocculation systems in water treatment plants, ensuring increased floc concentrations and contact times for mixing of particles. It also provides a flexible and controllable system which automatically adjusts to a large range of flow conditions, without the need for complex control mechanisms.



Three generations of Penang water engineers (from left): Dato' Ir. Kam U-Tee, Ir. Goh Heng Chong and Dato' Ir. Dr Lee Yow Ching. (Photograph taken in 2002, at Teluk Bahang Dam, Penang)



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A 900,000-litre water tank

It is not possible to put into words all Dato' Kam's achievements in the water supply sector and how much his contributions have meant and continue to mean, to the people of Penang.

For his contributions, he received several national and Penang state awards including Darjah Yang Mulia Pangkuan Negeri DMPN (which carries the title of Dato') from Yang di-Pertua Negeri Pulau Pinang.

Dato' Kam passed away on 21 March 2014 at the age of 83 after a short illness. He had a long and successful career. Hard work, dedication and determination characterised this man of principles and integrity. The many PBA engineers and staff who he taught and trained will always be grateful to him.

This article is written to commemorate the third anniversary of the passing of Dato' Kam who will be remembered as an engineer who excelled in water supply engineering.

#### **Author's Biodata**

Dato' Ir. Dr Lee Yow Ching, is former Deputy Chairman and General Manager of Penang Water Authority. He graduated in Civil Engineering from the University of New South Wales, Australia and obtained a Doctorate in Business Administration from the University of South Australia. He was past Chairman of Northern Branch, IEM and received the Distinguished Engineer Award from the Penang Branch

#### **IEM DIARY OF EVENTS**

#### Title: Technical Visit to "Lafarge Concrete Plant, Petaling Jaya" 20 May 2017

Drganised by	: Civil and Structural Engineering Technical Division
ïme	: 9.30 a.m 1.00 p.m.
CPD/PDP	: 3

#### Title: 25th Annual General Meeting of Environmental Engineering **Technical Division, IEM**

#### 20 May 2017

Organised by	: Environmental Engineering Technical Division
Time	: 11.00 a.m 1.00 p.m.
CPD/PDP	: 2

Kindly note that the scheduled events below are subject to change. Please visit the IEM website at www.myiem.org.my for more information on the upcoming events.

# **Is Engineering Still Cool?**

WOMEN ENGINEERS SECTION

#### reported by



he Women Engineers Section and IEM Business Club organised a half-day forum on "Is Engineering Still Cool?" at Wisma IEM on 18 February, 2017, to discuss the public perception, challenges and opportunities across gender and generation in today's world of engineering.

Engineering is the forerunner for the development and progress of nations. There is no doubt that technology innovations will radically change every aspect of our lives today and some are disruptive while others are not. The forum brought together seven panel speakers spanning 3 generations with a wide range of experience and expertise. These were Ir. Elias Saidin and Ir. Raftah Mahfar (Baby Boomer generation), Ir. Puvanesan Mariappan and Ir. Tan Loo Yen (Millennials or Generation Y) and Mr. Tan Khai Ping and Miss Tan Chau Ling (Generation Z).

Both Generation Z speakers are currently student members of IEM. The Young Engineers Section (IEM-YES) was represented by Mr. Tay Eng Chong, also a Millennial. The forum moderators were Prof. Ir. Dr Abu Bakar Mahat from IEM Negeri Sembilan branch and Ir. Mah Siew Kien from Women Engineers Section.

The forum started with an experience-sharing session by the speakers. The Baby Boomer and Millennial speakers shared their work experiences, career paths, motivations, strength and challenges in their journey to becoming Professional Engineers.

Ir. Elias, current Vice-President of IEM, stressed on the importance of international mobility of engineers in an increased need for engineers to have their credentials recognised within ASEAN to prepare for globalisation and advances in international trade and business services. All qualified engineers are encouraged to register as an ASEAN Engineer to facilitate mobility within the ASEAN countries towards branding and liberalisation of engineering profession. Ir. Raftah believed that one can overcome all challenges and obstacles through perseveration, determination and hard work; these were the ingredients in her recipe for success as a geotechnical engineer. It is evident that the Baby Boomer speakers have worked very hard throughout their career and are still actively contributing to the engineering professional passionately as they view engineering as cool and interesting.

But do Millenials and Generation Z share similar sentiments?



From L to R: Ir. Mah Siew Kien, Mr. Tan Khai Ping, Ms. Tan Chau Ling, Ir. Dr Leong Wai Yie, Ir. Prof. Dr Abu Bakar, Ir. Elias Saidin, Ir. Raftah Mahfah, Ir. Tan Loo Yen, Mr. Tay Eng Cheong, Ir. Puvanesan Mariappan

Ir. Puvanesan developed an interest in engineering at an early age because of his father's encouragement and support. Parents play an active role in building their children's interest in engineering. Another Millenial, Ir. Tan, agreed that engineering is cool and can be realised through the appreciation of engineering innovations and achievements that have transformed our lives for centuries. The two said that like Baby Boomers, Millennials viewed their generation as hardworking and dedicated.

Mr. Tay talked about current challenges in promoting STEM and efforts to cultivate and expose young engineers to the professional engineering world.

Generation Z will soon be entering the workforce and their characteristics and motivators are quite different from that of previous generations. It is therefore, important to find new ways to make engineering more appealing to them. A radically different generation requires a radically new approach.

In the second session of the forum, the 3G (Gender, Generation and Globalisation) challenges in engineering were discussed. The lack of interest in STEM among schoolchildren has persisted for years and has now reached a level of concern. According to the two student speakers, many of their peers shy away from engineering studies because the subjects are perceived as tough and difficult. Since engineering students have to work harder

# FORUM



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- Competent in writing technical reports and making presentations
- Responsible for technical direction, supervision and mentoring a team of Engineers for Rail and Road Bridge Projects
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Closing date: 31 May 2017 Please note that only shortlisted candidates will be notified than other major students, today's fresh graduates believe they should be compensated fairly when they start working, especially with the high cost of living today. Salary is usually the deciding factor and the most important consideration for these fresh graduates when choosing a job. Thus, organisations which offer competitive remunerations are able to attract the cream of the crop.

The shortage of engineering graduates is further compounded by the fact that Generation Z is more entrepreneurial than previous generations. An increasing number are starting their own businesses upon graduation. Engineering graduates are also highly sought after in business and finance. In a way, the engineering field is competing with many other pulls from sectors that are a lot more vocal, so engineering is appearing to be slowly losing its "cool" for Generation Z.

The engineering profession suffers from a lack of visibility and engineering role models, unlike medicine and law which are more popular because of vast media exposure and daily interactions in our daily lives.

Engineering accomplishments are also over shadowed by other professions. For example, when one sees an extraordinary, impressive building, one asks, "Who's the architect?". And while most of us know Michael Schumacher, the legendary Formula One driver, how many show an interest in the engineers behind the cars?

Engineers need to tell the world of their works and it's important to leave "professional fingerprints" for the public to see. Hollywood movies such as *Iron Man* and the Christopher Nolan film, *Interstellar*, have engineering themes and these can inspire students to take up engineering studies. A new media portrayal of engineering will be helpful, such as TV series and movies which feature engineers as the protagonist.

In the Q&A session which followed, there were many comments and opinions from participants, including the belief that fresh graduates should place more importance on the opportunity to learn, grow and contribute before demanding an unrealistically high salary. Forum participant Ir. Kamal Jamaluddin from the Malaysian Board of NLP Professionals (MBNLP), suggested that engineers upgraded themselves to be more effective communicators. This, he said, can be achieved through the use of neuro linguistic programming (NLP), a methodology to understand and help change human behaviour patterns.

The forum concluded with the view that more has to be done to keep engineering "cool" for future generations while current engineers need to deal with ever-increasing globalisation and to find ways to prosper within an integrated international environment. The challenge to ensure that a talent pipeline continues to exist is becoming more critical, irrespective of gender. We need the public to recognise that engineering is creative, interesting, exciting and a rewarding, life-long career option.

THE INSTITUTION OF ENGINEERS, MALAYSIA

JURUTERA • MAY 2017

# Half-Day Seminar on "Construction Adjudication Under CIPAA 2012, from Form 1 to Form 16 and Beyond"

DISPUTE AVOIDANCE AND RESOLUTION PRACTICE SUBCOMMITTEE

#### reported by



half-day seminar on "Construction Adjudication under CIPAA 2012, from Form 1 to Form 16 and Beyond" was held on 11 February, 2017, in the TUS Lecture Room, Wisma IEM. The seminar was conducted by Ir. Leon Weng Seng with Ir. Dr Ooi Teik Aun as Chairman. About 40 participants attended and there was an active Q&A session at the end.

To illustrate the acceptance and popularity of adjudication, statistics (since its enforcement on 15 April 2014 to November 2016) were provided for cases registered, parties involved (developer, employer, consultant, main contractor, subcontractor, supplier, etc.), types of claims (interim payments, final accounts, professional fee, retention monies, extension of time, variations, defective works etc).

The Claimants had 91% of decisions made in their favour and many decisions were enforced by the courts (S28). The participants were heartened to learn that CIPAA was applicable retrospectively, i.e. for contracts and disputes even if these arose before 15 April, 2014.

Differences were highlighted between ad hoc, contractual and statutory adjudications.

The flow charts were routed through from Payment Claim (Form 1), Payment Response (S6 & Form 2), Notice of Adjudication (S8 & FORM 3), Adjudication Claim (S9 & Form 7), Adjudication Response (S10 & Form 8) and Adjudication Reply (S11 & Form 9). The process takes 45 working days from Notice of Adjudication, with another 45 working days for Adjudication Decision (Form 15 & 16). This made up a total of 90 working days.

CIPAA has made the conditional payments (S36) (i.e. pay when pay, pay if pay, pay only when drawdown, etc.) illegal and this is a welcome statutory provision. The Claimant can now rely on the contractual duration for their certificates to be honoured and, if there is none, the statutory period of 30 days will apply (S36). An Adjudicator can be appointed by Parties (S22) or by the Director of KLRCA (S23), and the Adjudicator derives his power from S25 of CIPAA, subject to the duties and obligations stated in (S24). The cost of adjudication and the adjudicator's fees and expenses are governed by CIPAA Regulation 7 & 8 and the adjudicator must award cost to the winning party as he has no discretion (S18).

The Claimants (winner), especially subcontractors, will have remedies such as suspension or reduction of rate of Progress of Performance (S29), direct payment from Principal (S30), enforce the Adjudication decision as court judgement (S28) or to concurrently exercise all these remedies (S31). The Respondent (loser) may apply to the court to set aside the decision (S15) or to stay it (S16).

The Parties are encouraged to keep better records, the Contract Administrator will require to be focused and to issue appropriate certificates on time and the Employer will need to observe the payment schedule promptly and fully.

The overall effects will be better cash flow, smoother execution of quality work and a healthy construction environment.



The Seminar in progress

### FORUM

# IEM's First Meeting with Staff and IEM Student Section Representatives of Universities in the Central Region

SUB COMMITTEE ON MEMBERSHIP DRIVE AND PROMOTIONS

#### reported by





Participants who attended the morning dialogue session

The Sub-Committee on Membership Drive and Promotions (MDP) organised an inaugural meeting between MDP, staff representatives of universities and IEM Student Sections of the universities in the Central Region. It was held on 28 February, 2017, at Bangunan Ingenieur, to allow universities provide feedback on activities organised by IEM within and outside the universities. The ultimate objective was to ensure that IEM continued to stay relevant to both the staff and students in tertiary institutions.

A total of 21 public and private universities participated and MDP took the opportunity to understand the needs of students and the universities as well as current issues. This would help MDP develop a closer rapport with the various engineering faculties of the participating universities. The meeting also discussed ways to help develop and nurture a better understanding amongst students on the role of IEM and the benefits of being a member.

During the two dialogue sessions, both the university staff and IEM Student Section representatives shared ideas and said there was a need to further enhance the existing collaboration between IEM, the IEM Student Sections and the respective universities. Several universities that do not have IEM Student Sections also expressed an interest in establishing IEM Student Sections in their universities and in executing a collaborative MoU with IEM. By establishing a Student Section in the universities, IEM will be able to



Participants who attended the afternoon dialogue session



Recognition of Most Active Student Section to UiTM

promote awareness among engineering students on the importance of being a professional engineer at an early age, as well as provide a platform for them to be involved in various engineering related activities.

MDP also took the opportunity to present "The Most Successful IEM Student Section" award to IEM-UiTM Student Section for outstanding performance in the recruitment of Student Members for 2016. IEM received 807 applications from UiTM for Student membership last year.

In conclusion, the exchange of ideas, input and feedback during the meeting will be helpful in assisting IEM stay ahead as the preferred institution for the universities. We would like to thank all participants for their attendance and for assisting IEM achieve its vision to increase its membership to 100k by 2020.



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#### GLOBE TREKKING

# **Faith in Rock Climbing**



#### Ir. Chin Mee Poon www.facebook.com/chinmeepoon

Ir. Chin Mee Poon is a retired civil engineer who derives a great deal of joy and satisfaction from travelling to different parts of the globe, capturing fascinating insights of the places and people he encounters and sharing his experiences with others through his photographs and writing.

which the pinnacleshaped outcrop as our guiding beacon, we walked about 1km from the road, over stony farmland and a dry river bed. Then we wound our way up a fairly steep rocky slope until we reached a narrow platform at the foot of the pinnacle itself.

My friends and I had come to visit Abuna Yemata Guh, a tiny rockhewn church often dubbed "Church in the Sky". We were in Tigray, the northern most region of Ethiopia. Outstanding attractions in this region include the very long monolith stelae of Axum and the many rockhewn churches scattered in 4-5 clusters in the region.

After having seen the stelae in Axum, we only had time to visit one rockhewn church on our way to Mekele. Not wanting to see anything similar to the rockhewn churches we had visited in Lalibela earlier, we

picked Abuna Yemata Guh, without really knowing what to expect.

It was already more than an hour since we left the van on the roadside, so the church we had come to see should be just around the corner... or so we thought, until our driver-cum-guide told us to remove our trekking shoes and prepare to climb on all fours. "It's easier to climb bare-footed," he said, pointing to the sheer rock face that we were standing next to. Looking up, I saw a pointed column of rock piercing the cobalt blue sky. Oh my! I'd never



done any rock-climbing in my life, not even in a shopping complex.

Fortunately, 5 villagers came to give us a helping hand. They stationed themselves at various heights on the rock face and guided us on footholds and handholds as well as gave us a pull or a push whenever necessary. And so we made it to the next level. Whew!

But that was not the end of the story. The church was further up. Another sheer cliff face was waiting for us to climb. With more confidence built on the little experience we had just gained, we scrambled up to the church level, though not without the help of the villagers of course.

Still, the elusive little church was not in sight. It was hidden on the back of the pinnacle, separated from us by a 10m-long ledge just 1m wide, beyond the edge of which was a drop of 100m or more.

Overcoming our fear and walking gingerly with a hand against the cliff wall, we finally made it to the church entrance and the priest welcomed us into the tiny cave with two cupolas separated by a pillar. For our efforts, we were rewarded with exquisite, bright polychrome paintings of biblical scenes covering the walls and ceilings.

The tiny, rock-hewn church, sometimes said to be the most inaccessible place of worship in the world, was believed to have

been built in the 5th century AD by Abuna Yemata, one of the 8 saints depicted on one of the cupolas. The frescoes were done in the 15th or 16th century.

Whoever built the church must have taken a long time to carve a cave into solid rock with only chisel and hammer. That it was built halfway up a sheer cliff, hidden from the open plain, seemed to indicate that the cave was originally meant to be a hermit's hideout and only became a church later.

#### **TEMUDUGA PROFESIONAL**

Kepada Semua Ahli,

Tarikh: 10 April 2017

#### SENARAI CALON-CALON YANG LAYAK MENDUDUKI TEMUDUGA PROFESIONAL **TAHUN 2017**

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Mengikut Undang-Undang Kecil IEM, Seksyen 3.8, nama-nama seperti tersenarai berikut diterbitkan sebagai calon-calon yang layak untuk menjadi Ahli Institusi, dengan syarat bahawa mereka lulus Temuduga Profesional tahun 2017.

Sekiranya terdapat Ahli Korporat yang mempunyai bantahan terhadap mana-mana calon yang didapati tidak sesuai untuk menduduki Temuduga Profesional, surat bantahan boleh dikemukakan kepada Setiausaha Kehormat, IEM. Surat bantahan hendaklah dikemukakan sebulan dari tarikh penerbitan dikeluarkan.

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FAIZUL	IZUAN BIN SHAIMI	BE HONS (UITM) (CIVIL, 2005)				
NG CHE	E HIONG	BE HONS (UMS) (CIVIL, 1999)				
		MSc (UMS) (CIVIL, 2005)				
WONG		BE HONS (LITAR) (CIVIL 2012)				
Worton						
KE.ILIE	RITERAAN EI EKTRIKAI					
MOHD	SYAWAL NIZAM BIN	BE HONS (LIITM) (ELECTRICAL 2007)				
SHARIF	UDIN	CONVERSION (UNITEN) (2012)				
NUR AS	HIDA BINTI SALIM	BE HONS (UITM) (ELECTRICAL, 2004)				
		ME (MALAYA) (2007) PhD (UITM) (2015)				
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FAKHRU	JL ZAMAN BIN ROKHANI	BE HONS (UTM) (ELECTRICAL-MECHATRONICS, 2002)				
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	MUN					
NO KOP		BE HONG (OTHIN) (ELECTRICAE, 2002)				
KE.IUF	UTERAAN GEOTEKNIKA	4				
AHMAD	SYAIFUL BIN MOHD SOM	BE HONS (UTM) (CIVIL, 2003)				
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KHAIRIL	ANWAR BIN ABU KASSIM	BE HONS (OKAYAMA) (MECHANICAL, 2000)				
PATRICI	K SIAW TING CHIANG	BE HONS (MALAYA) (MECHANICAL, 1999)				
VASANT	THATHIBAN A/L PERIASAMY	BSc (WICHITA) (MECHANICAL, 2012)				
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LAI HON	I KUAN	BE HONS (USM) (CHEMICAL, 2002)				
PERPINDAHAN AHLI						
No.	Nama	Kelayakan				
Ahli						
KEJUF	RUTERAAN AWAM					
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78891	KHOR OOI CHONG	BE HONS ( UTM) (CIVIL, 2007)				
58679	KHOR WEI HUAT	BE HONS (USM) (CIVIL,2010)				
27074	LOGANATHAN RADZAKRISH	NAN BE HONS (UNISEL) (CIVIL, 2006)				

BE HONS (MALAYA) (CIVIL, 2004)

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75385	HASMAINI BINTI MOHAMAD	BE HONS (MALAYA) (ELECTRICAL, 1999) ME (MALAYA) (2004) PhD (MALAYA) (2013)
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43683	ZANIF BIN ZAINUL ABIDIN	BE HONS (UTM) (ELECTRICAL, 2007)
58639	FELIX HO FENG NAM	BE HONS (UTEM) (COMPUTER ELECTRONICS, 2 CONVERSION (UNITEN) (2014)
KEJUF	RUTERAAN ELEKTRONIK	
90775	ALIFF BIN LATIP	BE HONS (UTM) (COMPUTER, 2010)
78910		BE HONS (UKM) (ELECTRICAL, ELECTRONIC & SYSTEM, 1999) BS2 (SOUTH DAKOTA) (ELECTRICAL, 1995)
15211	KAWLI BIN ADNAN	MSc (DREXEL) (ELECTRICAL, 1993) PhD (UKM) (2007)
79049	SUHANA BINTI SULAIMAN	BSc (UTAH) (ELECTRICAL, 1996) MSc (NEW CASTLE) (MICROELECTRONICS, 200 PhD (UITM) (2013)
76083	SYED ABDUL MUTALIB AL JUNID BIN SYED ABDUL RAHMAN	BE HONS (UITM) (ELECTRICAL, 2006) ME (UITM) (ELECTRICAL, 2010)
70318	BANU A/P POOBALAN	BE HONS (UNIMAP) (INDUSTRIAL ELECTRONIC, 2007)
KEJUF	RUTERAAN MEKANIKAL	
47570	ADZLI MOHD YUSOF	BE HONS (USM) (MECHANICAL, 2006) ME (UPM) (MANUFACTURING SYSTEMS, 2014)
28169	ARVINTHAN VENUGOPAL	BE HONS (UTM) (MECHANICAL-AERONAUTICS, 2009)
37532	EOW CHIA LOON	BE HONS (UKM) (MECHANICAL, 2010)
38883	MD SAIDIN BIN WAHAB*	BE HONS (UITM) (MECHANICAL, 1998) ME (SOUTH AUSTRALIA) (ADVANCED MANUFACTURING TECH, 2004) PhD (LEEDS) (20
41136	MOHD HASRUL FADLY BIN SULAIMAN	BE HONS (UITM) (MECHANICAL, 2007)
60052	MOHD NURFADZLY BIN NAJAMUDIN	BE HONS (UKM) (MECHANICAL, 2006)
37582	NG SEE KIAT	BE HONS (SHEFFIELD HALLAM (MECHANICAL & MANUFACTURING, 2007) ME (UTM) (MECHANIC 2013)
36312	TEDDY YEE CHEN VEE	BE HONS (UTM) (MECHANICAL, 2005)
KEJUF	RUTERAAN MEKATRONIK	
49602	NURFAIZAL BIN WAHI	BE HONS (IIUM) (MECHATRONICS, 2010)
KEJUF 24079	RUTERAAN SUMBER AIR	
24019	WAT TAU SENG	(2006) PhD (UNIMAS) (2009)
KEJUF	RUTERAAN PEMBINAAN	
64736	JEREMY TAN TZE SHEN	BE HONS (BIRMINGHAM) (CIVIL, 2008) MSc (BIRMINGHAM) (CONSTRUCTION MANAGEMEN 2009)
KEJUF	RUTERAAN KIMIA	
51262	CHONG WOON CHAN*	BE HONS (UTM) (CHEMICAL, 2009)
26323	LOW WAI CHEONG	BE HONS (UTM) (CHEMICAL, 2007)
PEI KEJUF	RMOHONAN BARU/PEMII	NDAHAN MENJADI AHLI KORPORA
TOK CH	IYE HOCK	BE HONS (UTM) (MECHANICAL-AUTOMOTIVE, 2
KEJUF	RUTERAAN AWAM	
TONG L	ING SIEW	BE HONS (LIVERPOOL) (CIVIL, 2002) PhD (LIVERPOOL) (2007)

#### IEM DIARY OF EVENTS

#### Title: Talk on Risk Management for New Product **Development**

#### 20 May 2017

Organised by	: Electrical Engineering Technical
	Division
Time	: 11.05 a.m 1.00 p.m.
CPD/PDP	: 0

Kindly note that the scheduled events below are subject to change. Please visit the IEM website at www.myiem. org.my for more information on the upcoming events.

#### **PERMOHONAN BARU / PEMINDAHAN AHLI**

Persidangan Majlis IEM yang ke-401 pada **21 March 2016** telah meluluskan sebanyak **860** ahli untuk permohonan baru dan permindahan ahli. Berikut adalah senarai ahli mengikut disiplin kejuruteraan:

	GRED KEAHLIAN									
DISIPLIN	FELO	SENIOR	AHLI	COMPANION	SISWAZAH	"INCORPORATED"	"AFFILIATE"	"ASSOCIATE"	SISWA	JUMLAH
Aeronautikal									11	11
Aeroangkasa			1						2	3
Pertanian					1					1
Kimia			4	1	16		1		70	92
Awam	1		29	4	47				189	270
Komunikasi					2					2
Elektrikal & Elektronik									19	19
Elektrikal			20		34	1			142	197
Elektronik			4	1	17				49	71
Alam Sekitar					8				13	21
Proses & Makanan					1					1
Industri					4					4
Pembuatan					3				6	9
Bahan			1		1				26	28
Mekanikal			13	3	43				37	96
Mekatronik			1	1					21	23
Sumber Mineral									2	2
Perlombongan						1				1
Petroleum					1				1	2
Polimer									4	4
Struktur			1						1	2
Telekomunikasi			1							1
JUMLAH	1	0	75	10	178	2	1	0	593	860

Senarai nama ahli dan kelayakan adalah seperti di bawah. Institusi mengucapkan tahniah kepada ahli yang telah berjaya.

#### Ir. Yam Teong Sian

Setiausaha Kehormat, Institusi Jurutera Malaysia

PERMINDAHAN AHLI KEPADA AHLI		28313	MOHD SAFWAN BIN HARUN	BE HONS (UTM) (CIVIL, 2007)	54284	MOHD SHAHRIZAL BIN MOHD YUSNI	BE HONS (UITM) (ELECTRICAL, 2008)	
No. Ahli	Nama	Kelayakan	52527	MUSTAQQIM BIN ABDUL RAHIM	BE HONS (UNIMAS) (CIVIL, 2008) ME (UPM) (STRUCTURAL &	44599	PAIROLANI BIN SAFARI @ HJ. HASHIM	BE HONS (UNITEN) (ELECTRICAL POWER, 2006)
KEJU	RUTERAAN AWAM				CONSTRUCTIONS, 2012)	30600	ROSLAN BIN	BE HONS (USM) (ELECTRICAL
19650	MOHAMAD HANIFFA	BSC (GLASGOW) (CIVIL, 1985)	26012	SIMON LOW YEW	BE HONS (UTHM) (CIVIL, 2006)		MOHAMED YUSOF	POWER, 2002)
	BIN HJ. ABDUL	MSC (STRATHCLYDE) (PUBLIC	51265			51350	ZAKARIA	(INDUSTRIAL POWER, 2006)
	HAMID	CONTROL. 1987)	23047	τανι καινι ήψα	BE HONS (UMS) (CIVIL, 2002)	58626	SHARIMAN	BSC (HANYANG) (ELECTRICAL
		· · · · · · · · · · · · · · · · · · ·	28216	TEH WEI SHENG	BE HONS (MALAYA) (CIVL.		EFFENDI B.	& COMPUTER, 2008)
F	PERMINDAHAN	AHLI KEPADA AHLI	20210		2007)	50400	SHARANI	CONVERSION (UNITEN) (2011)
	KOR	PORAT	41132	THOMAS CHAONG	BE HONS (UITM) (CIVIL, 2006)	59138	HUSSEIN B. WAN	(ELECTRICAL, 2009)
No.	Nama	Kelavakan	04475	ANAK BUMA			OMAR	
Ahli			211/5	TOH CHIN KOK	(CIVIL-CONSTRUCTION			
KEJU	RUTERAAN AERO	ANGKASA			MANAGEMENT, 2001)	KEJU	RUTERAAN ELEKT	RONIK
34191	EDIE NOREFFENDI	BE HONS (UPM)				72907	AL-KHALID BIN HAJI	BE HONS
	ABDUL KADIR	(AEROSPACE, 2004)	KEJU	RUTERAAN BAHAN	N		OTTIMAN	(ELECTRICAL&ELECTRONIC,
			25800	ANG BEE CHIN	BE HONS (MALAYA)			1995) MSC (NOTTINGHAM)
KEJU					MESC (MALAYA) (2007)			TECHNOLOGY, 1996) PHD
26426	ABDUL MANAF BIN JAAFAR @ YAHAYA	BE HONS (UPM) (CIVIL, 2004)			PHD (MALAYA) (2011)			(NEWCASTLE UPON TYNE) (2007)
44534	AWANG ZAKRI BIN AWANG ADENI	BE HONS (UKM) (CIVIL & STRUCTURAL, 2006)	KEJU	RUTERAAN ELEKT	RIKAL	74407		
23422	CHANG CHUN KIAT	BE HONS (USM) (CIVIL, 2002)	57563	CHE YUSWADI BIN	BE HONS (UKM) (ELECTRICAL	/ 110/	BIN MOHAMAD	
	MSC (USM) (RIVER & URBAN DRAINAGE, 2007)		58008		BE HONS (MMU)		SALLEH	
37902	CHEONG HON	BE HONS (UKM) (CIVIL &	50050		(ELECTRONICS, 2002)			
	WOOI	STRUCTURAL, 2007)			MSC (CARDIFF) (ELECTRICAL	KEJU	RUTERAAN KIMIA	
37254	FARIDAH BINTI	BE HONS (UTM) (CIVIL-	66382	ERWAN BIN	BE HONS (MALAYA)	4109	C. M. BALARAM A/L K. P. NAIR	BE (MYSORE, INDIA) (CHEMICAL, 1974)
49956	KANDASAMY S/O	BE HONS (OLIFENSI AND)	00002	SULAIMAN	(ELECTRICAL, 2002)			MSC (MANCHESTER) (1975)
40000	SUBRAMANIAM	(CONSTRUCTION			ME (KUITTHO)			
	MANAGEMENT, 2001)				PHD (NAGOYA) (2012)	KEJURUTERAAN MEKANIKAL		
		(STRUCTURAL, 2006)	48914	ISHAN BHARAT	BE HONS (UNITEN)	46825	CHIA CHEE WENG	BE HONS (MALAYA)
		IEM/BEM EXAMINATION		KUMAR PATEL	(ELECTRICAL & ELECTRONICS 2009)	53760		(MECHANICAL, 2004)
28437	LEE LEONG WEL	BE HONS (LITAR) (CIVIL 2010)	49294	LIM CHENG SYEN	BE HONS (UPM) (ELECTRICAL	33703	NASRUDDIN	(MECHANICAL, 2008)
52339	LIEW CHIA HOU	BE HONS (WESTERN			& ELECTRONICS, 2010)	55855	LIM YEE TAT	BE HONS (UPM)
52000		AUSTRALIA) (CIVIL, 2011)	28988	LIM THAN SOON	BE HONS (USM)			(MECHANICAL, 2008)
27963	MOHD ANAZZAIRY	BE HONS (VANDERBILT)	44600		(ELECTRICAL, 2006)	43649	MOHAMAD AZWAN BIN MAD NASER	BE HONS (MALAYA) ( MECHANICAL, 2004)
07050	BIN ABD RAHMAN	(CIVIL, 2005)	44028	MUHAMAD @	(ELECTRICAL POWER, 2011)	32406	MOHD FAHIM BIN	BE HONS (UITM)
27852	HISYAM BIN AB	BE HUNS (USM) (CIVIL, 2007)		MUHAMAD YASIN			ILIAS	(MECHANICAL, 2010)
	MANAF		70631	MOHD HELMI BIN ABDUL RAHMAN	BE HONS (UM) (ELECTRICAL, 2005)	27967	MOHD. JAFRIZAL BIN JAMALI	BE HONS (UPM) (MECHANICAL, 2004)

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#### **KEAHLIAN**

50208	MUHD ASYRAF BIN ABD AZIZ	BE HONS (UTM) (MECHANICAL, 2007)
13509	NG BOON WAI	BE HONS (UKM) (MECHANICAL & MATERIAL, 1993)
47121	SIVA KUMAR A/L SIVANESAN	BE HONS (UPM) (MECHANICAL, 1999) ME (UPM) (MANUFACTURING SYSTEM, 2006) PHD (UNITEN) (2012)
33818	TAN PEY HWAN	BSC (MICHIGAN TECHNOLOGICAL) (MECHANICAL, 1997)
47575	YONG GEE SUAN	BE HONS (MMU) (MECHANICAL, 2006)
KEJU	RUTERAAN STRUK	TUR
45311	YEE MING JIUNN	BE HONS (BRADFORD) (CIVIL & STRUCTURAL, 2008) ME (BRADFORD) (CIVIL & STRUCTURAL, 2008)
KEJU	RUTERAAN TELEK	OMUNIKASI
54548	LIM KOK SING	BE HONS (MALAYA) (TELECOMMUNICATION, 2008) PHD (MALAYA) (2011)
PERM	OHONAN MEN.	JADI AHLI KORPORAT
Nama		Kelayakan
KEJUF	RUTERAAN AWAM	
AHMAD FAUZI	DENNEY BIN AHMAD	BE HONS (KANSAS) (CIVIL, 1998)

FAUZI	1998)
AHMAD FAUZAN BIN MOHD SABRI	BE HONS (UTM) (CIVIL, 2006)
AHMAD IRFAN BIN HASAN	BE HONS (UKM) (CIVIL, 2000)
LIAU KOK SIONG	BE HONS (PORTSMOUTH) (CIVIL, 1999) MSC (PORTSMOUTH) (CIVIL, 2001)
MOHD LUKMAN BIN MAMAT	BE HONS (UTM) (CIVIL, 2004)
MOHD. HELMI BIN MOHD. SARI	BE HONS (UTM) (CIVIL, 2008)
MUNIR NAZMI BIN	BE HONS (USM) (CIVIL, 2006)

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1	08021	AB. AZIZ BIN AHMAD
2	24492	ABDUL AZIZ BIN MAT ALI
3	12445	ABDUL AZIZ BIN MOHD. KHALID
4	10618	ABDUL RAHIM BIN ABD. MALIK
5	11026	ABDULLAH BIN OTHMAN
6	13552	ABI SOFIAN BIN ABDUL HAMID
7	43718	ABU BAKAR BIN ABD AZIZ
8	10136	AHMAD FITRI BIN OTHMAN
9	15350	AHMAD RAFA'EE BIN JOHARI
10	15963	AHMAD ZAINI BIN ABDUL KARIM

11	04812	ARIFFIN LEE BIN ABDULLAH @ LEE KIM SENG, FRANCIS
12	38728	AU MAAN WAH
13	14350	AZHAR BIN AHAMAD
14	10681	BASHIR AHAMED BIN MAIDEEN
15	10057	BOEY HOR MENG
16	09646	CHAI SIEW KEY
17	09450	CHE ABDULLAH FAUZI BIN HAJI OTHMAN
18	12820	CHE UJANG BIN IBRAHIM
19	11946	CHEW YEE CHUAN
20	14115	CHIN CHEE KHEONG
21	17371	CHONG PANG CHONG @ CHOONG TUN CHONG
22	59113	CHONG SHIAU IUN, ABRAHAM
23	04855	CHU TET LIN, JOSEPH
24	13505	CHUA BOON HWEE
25	15463	DAUD BIN ABAS
26	08385	DHILEEPAN RAMAN NAIR
27	12569	EWEDY BACHI
28	19592	FATHULLAH RAZZAQ BIN GHAZALI
29	06580	FAUZI BIN ABDULLAH
30	06869	GAN WEE PENG
31	03457	HARBANS SINGH S/O KISHAN SINGH
32	36364	HARTINI BINTI ALI
33	02728	HII HIENG HUI
34	38133	HISHAM BIN MOHAMAD
35	05955	HONG LING YEAN
36	07691	IDRIS BIN MOHAMED @ MAMAT
37	09391	
38	11326	
39	16514	JAILANI BIN SALIHON
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41	04972	
42	08701	JOHN SELVIN S/O HENRY SAMUEL
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56	04979	LIM OOI JOO, PAUL
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58	29646	LIM XIN YI
59	17350	LOW AH KEONG, LAWRENCE
60	15677	MASHITAH BT. HAJI MD. JAIS
61	44112	MAT ISA BIN JAAFAR
62	29729	MEGAT AJIB BIN ABD HAMID
63	18207	MEGAT SHARIFFUDIN BIN IBRAHIM
64	87416	MOHAMAD FASYAN BIN MOHAMAD SABRI
65	18916	MOHD RUSLI BIN SAKTI
66	12809	MOHD SABRI BIN ARDULLAH
67	08692	MOHD SABRI BIN ZAKARIA
68	17616	MOHD AZI ANI BIN SEHAP
69	06789	
70	02875	
70	18015	
72	23064	
72	23904	
13	39166	MUHAMMAD TAIB

74	84901	MUHAMMAD KHUZAIFAH BIN HASSAN
75	05387	MUHAMMAD RAZIF BIN HAJI IBRAHIM
76	23029	NG CHEE KIONG
77	16264	NG HOCK SENG
78	21575	NGIM CHIN KIM
79	87687	NGO CHOON LIANG
80	17306	NOOR RAZMAN BIN ABDUL RAZAK
81	71132	
82	53828	
83	71674	
84	12544	ONG BOON HAL
85	22288	PANG YOON KHONG
86	14472	
87	14396	PHUA FOO YONG
88	11588	POOK FONG FEE
89	09129	POR CHOON SENG
90	07021	
01	2/315	
02	27130	
03	34204	
04	00654	
94	09004	
95	01930	
90	15340	
97	15416	
98	27138	
99	69574	SDRI. LIEW SHIN YING
100	14537	SEE CHENG SENG
101	12910	SHAHARUDDIN BIN HARIS LIM
102	06979	SHAHIDI BIN SABRI
103	06121	SHAHRUDDIN BIN KASSIM
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105	14580	SIA TUNG KIONG
106	07030	SIM KET HUI, PATRICK
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125	24542	V. PARANJOTI A/L VEERAPPAN
126	15427	WAN MOHAMMAD BIN HAJI WAN NIK
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