

ISSN 0126-9909

KDN PP 1050/12/2012 (030192)





ANNUAL DINNER & AWARDS NIGHT 2019

th

JURUTERA MELLEMENTERA

Circulation and Readership Profile

JURUTERA has an estimated readership of **198,000** professionals. Our esteemed readership consists of certified engineers, decision making corporate leaders, CEOs, government officials, project directors, entrepreneurs, project consultants, engineering consulting firms and companies involved with engineering products and services.

Advertising Benefits

Our business partners can be assured that their products and services will be given the circulation and exposure they deserve, thus maintaining a sustained advertising presence to our core readers of decision-making engineers and technical experts. Our website offers an even wider market reach, with added international presence, aided by our international affiliation with official engineering bodies all over the world. Our online and offline advertising features such as banner advertising, article sponsorship and direct e-mail announcements have proven to be successful marketing strategies that will set the businesses of our partners apart from their competition.









HALL IN A AND	FRICES FER INSERTION IN RINGGIT MALATSIA (RM)				
SPECIFIED POSITION (Full Colour Ad)	1 INSERTION	3 INSERTIONS	6 INSERTIONS	9 INSERTIONS	12 INSERTIONS
Outside Back Cover (OBC)	7,800	7,050	6,750	6,450	6,150
Inside Front Cover (IFC)	7,250	6,650	6,350	6,050	5,750
Inside Back Cover (IBC)	6,750	6,250	5,950	5,650	5,350
Page 1	6,650	6,150	5,850	5,550	5,250
Facing Inside Back Cover (FIBC)	6,150	5,850	5,550	5,250	4,950
Facing Cover Note (FCN)	5,850	5,300	5,100	4,900	4,700
Facing Contents Page (FCP)	5,700	5,150	4,950	4,750	4,550
Centre Spread	11,200	9,500	9,000	8,500	8,000
ROP Full Page	4,900	4,500	4,300	4,100	3,900
ROP Half Page	2,900	2,650	2,550	2,450	2,350
ROP 1/3 Column	2,200	2,000	1,900	1,850	1,800
ROP 1/4 Page	1,950	1,750	1,650	1,600	1,550

ADVERTISING RATES

Special Position: +15%

Overseas Advertiser: +25% (Full Advance Payment Required) All prices shown above exclude Computer to Plate (CTP) charges *Please note that the above prices will be subjected to SST *Advertising rates displayed do not include 15% advertising agency commission

For advertising enquiries, please contact:



dimensionpublishing The Choice of Professionals

Dimension Publishing Sdn. Bhd. (449732-T)

Level 18-01-02, PJX-HM Shah Tower, No. 16A, Persiaran Barat, 46050 Petaling Jaya, Selangor Darul Ehsan, Malaysia. Tel: +603 7493 1049 Fax: +603 7493 1047 E-mail: info@dimensionpublishing.com Joseph How : +6011 1234 8181 Shirley Tham : +6016 283 3013



The Solution to Sustainability in Concrete Structures

Singapore's Orchard Road is one of the city's most coveted retail locations. This project won the Building and Construction Authority (BCA) award that recognizes behind-the-scenes engineers who overcome site challenges through creative engineering designs for site and public safety.

Engineers, Meinhardt Infrastructure, faced many design challenges including a canal that ran through the centre of the building site, a very high water table and greatly elevated sulphate levels in the surrounding soils. Xypex Admix C-Series with its non-toxic chemistry and ability to resist extreme hydrostatic pressure was used to address these key issues and was widely incorporated into elements of the substructure, the B1 canal, and the superstructure. Particularly challenging was the handling of the existing Stamford Canal that had to be diverted to another location to allow construction of a new, fully enclosed 10m x 5m reinforced concrete canal that now runs through basement level 1 (B1). Xypex Admix C-1000 NF was used to waterproof the canal's concrete base and walls. Tie-bolt holes and other concrete defects were repaired with Xypex repair materials.

313@Somerset achieved Green Mark Platinum status – the highest level under Singapore's Building and Construction Authority's Green Mark Scheme, and is the first project to achieve this status within Singapore's Orchard Road precinct.

For more information on how our solutions can provide sustainable benefits for your concrete assets, please visit our website at **www.xypex.com.au** or **LinkedIn Page.**



RNC Integral Concrete Technology (M) Sdn Bhd (436178-D) Exclusive applicator and distributor for Xypex in Malaysia, for **Xypex: Sustainability In Concrete Structures** solutions that includes conrete repair, protection and durability enhancement.

37 Jalan Putra Mahkota 7/7B Putra Heights 47650 Subang Jaya, Selangor Darul Ehsan

Tel: +603-51928186 Fax: +603-51926826 Email: support@waterproofing.com.my www.waterproofing.com.my



Intelligent Awareness Any Moment, Any Condition

- Highly-accurate video content analysis to enhance perimeter protection
- Non-contact temperature measurement to prevent equipment breakdowns
- Vigilant fire detection to pinpoint potential risks in the first place
- Augmented with visible light imaging and visualized metadata









Number 05, MAY 2019

IEM Registered on 1 May 1959

MAJLIS BAGI SESI 2018/2019 (IEM COUNCIL SESSION 2018/2019)

YANG DIPERTUA / PRESIDENT

Ir. David Lai Kong Phooi **TIMBALAN YANG DIPERTUA / DEPUTY PRESIDENT** Ir. Ong Ching Loon

NAIB YANG DIPERTUA / VICE PRESIDENTS

Ir. Prof. Dr Ruslan bin Hassan, Ir. Lai Sze Ching, Ir. Lee Boon Chong, Ir. Prof. Dr Norlida bt Buniyamin, Ir. Prof. Dr Jeffrey Chiang Choong Luin,

Ir. Ellias Saidin, Ir. Gopal Narian Kutty SETIAUSAHA KEHORMAT / HONORARY SECRETARY Ir. Mohd Khir bin Muhammad

BENDAHARI KEHORMAT / HONORARY TREASURER

Ir. Dr Tan Chee Fai

BEKAS YANG DIPERTUA TERAKHIR / IMMEDIATE PAST PRESIDENT Ir. Dr Tan Yean Chin

BEKAS YANG DIPERTUA / PAST PRESIDENTS

Y.Bhg. Academician Tan Sri Dato' Ir. (Dr) Hj. Ahmad Zaidee bin Laidin, Y.Bhg Dato' Ir. Dr Gue See Sew, Y.Bhg. Dato' Paduka Ir. Prof. (Dr) Haji Keizrul bin Abdullah, Y.Bhg. Academician Dato' Ir. Prof. Dr Chuah Hean Teik, Ir. Choo Kok Beng WAKIL AWAM / CIVIL REPRESENTATIVE

Ir. Dr Lee Yun Fook

WAKIL MEKANIKAL / MECHANICAL REPRESENTATIVE Ir. Fam Yew Hin

WAKIL ELEKTRIK / ELECTRICAL REPRESENTATIVE Ir. Lim Kim Ten

WAKIL STRUKTUR / STRUCTURAL REPRESENTATIVE Ir. Dr Ng Soon Ching

WAKIL KIMIA / CHEMICAL REPRESENTATIVE

Ir. Prof. Dr Lee Tin Sin

WAKIL LAIN-LAIN DISPLIN / REPRESENTATIVE TO OTHER DISCIPLINES Ir. Roznan bin Abdul Rashid

WAKIL MULTIMEDIA DAN ICT / ICT AND MULTIMEDIA REPRESENTATIVE Ir. Dr David Chuah Joon Huang

WAKIL JURUTERA WANITA / WOMAN ENGINEERS REPRESENTATIVE Ir. Mah Siew Kien

AHLI MAJLIS / COUNCIL MEMBERS

Ir. Assoc. Prof. Dr Ahmad Kamil bin Arshad, Ir. Dr Tan Kuang Leong, Ir. Vincent Wong Khien Ngie, Y.Bhg. Lt. Jen. Dato' Wira Ir. Ismail bin Samion (Ret. RMAF), Y. Bhg. Dato' Ir. Hj. Anuar bin Yahya, Ir. Mah Way Sheng, Ir. Gunasagaran a/I Kristnan, Ir. Chen Harn Shean, Ir. Mohd Aman bin Hj. Idris, Ir. Wong Chee Fui, Ir. Prof. Dr Leong Wai Yie, Ir. Razmahwata Mohd Razalli, Ir. Abdul Razak Yakob, Ir. Yau Chau Fong, Y. Bhg. Dato' Ir. Foong Choy Chye, Y. Bhg. Dato' Ir. Kisai bin Rahmat, Y. Bhg. Dato' Ir. Nor Hisham bin Mohd. Ghazali, Ir. Toh Chin Kok, Ir. Dr Jeyanthi Ramasamy, Ir. Dr Wang Hong Kok, Ir. Yam Teong Sian, Y. Bhg. Dato' Ir. Hj. Fakharazi bin Hj. Wahijan, Ir. Yasotha Ramachandran Chetty, Ir. Mohmad Asari bin Daud, Ir. Dr Lai Khin Wee, Ir. Ng Beng Hooi

WAKIL BAHAGIAN JURUTERA SISWAZAH / YOUNG ENGINEERS SECTION REPRESENTATIVES

Yew Weng Kean, Addison Koh, Tony Ong, Kuugan Thangarajoo, Cheah Khai Chun **PENGERUSI CAWANGAN / BRANCH CHAIRMAN**

- Pulau Pinang: Ir. Yau Ann Nian
- 2 Selatan: Ir. Teo Ki Yuee
- Perak: Ir. Simon Yeong Chin Chow
 Kedah-Perlis: Ir. Haji Abdullah bin Othman
 Negeri Sembilan: Ir. Dr Oh Seong Por
- 6. Kelantan: Ir. Abrizan bin Abdul Kadir
- 7. Terengganu: Ir. Abdullah Zawawi bin Haji Mohd Noor
- Melaka: Ir. Sreedaran a/l Raman
 Sarawak: Ir. Haidel Heli
- 10. Sabah: Ir. James Yong Hon Min
- 11. Miri: Ir. Prof. Dr Lau Hieng Ho
- 12. Pahang: Y. Bhg. Dato' Ir. Sharuddin bin Mohd Simin

AHLI JAWATANKUASA INFORMASI DAN PENERBITAN / STANDING COMMITTEE ON INFORMATION AND PUBLICATIONS 2018/2019 Pengerusi/Chairman: Ir. Prof. Dr Ruslan Hassan Naib Pengerusi/Vice Chairman: Ir. Dr Lee Yun Fook

Setiausaha/Secretary: Ir. Lau Tai Onn

Ketua Pengarang/Chief Editor: Ir. Prof. Dr Ruslan Hassan

Pengarang Buletin/Bulletin Editor: Ir. Abdul Razak Yakob Pengarang Prinsipal Jurnal/Principal Journal Editor: Ir. Dr David Chuah Joon Huang Pengerusi Perpustakaan/Library Chairman: Ir. C.M.M. Aboobucker Ahli-Ahli/Committee Members: Ir. Ong Guan Hock, Ir. Yee Thien Seng, Ir. Chin Mee Poon, Ir. Dr Oh Seong Por, Ms. Michelle Lau Chui Chui, Ir. Prof. Dr Abdul Aziz bin Abdul Samad,

Ir. Dr Wang Hong Kok, Ir. Razmahwata bin Mohd Razalli, Dato' Ir. Nor Hisham Mohd Ghazali, Ir. Yasotha Ramachandran Chetty, Dr Sudharshan N. Raman

LEMBAGA PENGARANG/EDITORIAL BOARD 2018/2019

Ketua Pengarang/Chief Editor: Ir. Prof. Dr Ruslan Hassan Pengarang Buletin/Bulletin Editor: Ir. Abdul Razak Yakob Pengarang Jurnal/Journal Editor: Ir. Dr David Chuah Joon Huang Ahli-ahli/Committee Members: Ir. Lau Tai Onn, Ir. Ong Guan Hock, Ir. Yee Thien Seng, Ms. Michelle Lau Chui Chui, Ir. Dr Oh Seong Por, Ir. Dr Wang Hong Kok, Ir. Dr Lee Yun Fook, Ir. Yasotha Ramachandran Chetty, Dr Sudharshan N. Raman Secretariat: Janet Lim, May Lee

THE INSTITUTION OF ENGINEERS, MALAYSIA

Bangunan Ingenieur, Lots 60 & 62, Jalan 52/4, P.O. Box 223, (Jalan Sultan), 46720 Petaling Jaya, Selangor Darul Ehsan. Tel: 603-7968 4001/4002 Fax: 603-7957 7678 E-mail: sec@iem.org.my Homepage: http://www.myiem.org.my



CONTENTS





PRESIDENTIAL ADDRESS 2019





Networking with IEM Maximising Your Benefits as a Member16

Developing Engineering Workforce, **Designing a Better Future**

3rd Ir. Chiam Teong Tee Memorial Lecture, Delivered by Dato' Ir. Prof. Dr Chuah Hean Teik..23



2 SAFE TEA TIME Solution in a Checklist



FORUM

Technical Visit to KVMRT Line 2 - V207 Mined



ENGINEER'S ADVENTURES Green. Green Iceland

38 NEWS FROM BRANCH Chinese New Year Open House at IEMNS

PINK PAGE Professional Interview





BLUE PAGE



dimensionpublishing

The Choice of Professionals

Authorised Publisher: The Institution of Engineers, Malaysia (IEM) - JURUTERA

Explore our full set of Professional and Integrated **PUBLISHING MANAGEMENT SERVICES:**

- » Project Management
- » Creative Management
- » Ad Space Management
- » Mailing Management
- » Print Management
 - Annual Reports
 - Booklets Brochures
- Buntings
 Business Cards
 - CD / DVD Replications
- Calendars Cards & Invitations
- Certificates
 Custom Printings
 - Envelopes
 Folders
 - NCR Bill Books Notepads
 - Leaflets
 Letterheads
 - Paper Bags Posters
 - Stickers Others

manana

For enquiries, please contact:



dimensionpublishing The Choice of Professionals

Dimension Publishing Sdn Bhd (449732-T)

Level 18-01-02, PJX-HM Shah Tower, No. 16A, Persiaran Barat, 46050 Petaling Jaya, Selangor Darul Ehsan, Malaysia. Tel: +603 7493 1049 Fax: +603 7493 1047 E-mail: info@dimensionpublishing.com Shirley Tham : +6016 283 3013 Joseph How : +6011 1234 8181

NNUAL DINNER

AWARDS NIGHT

IURUTER

URUTER/

GLOBAL WARMING

GENESFIT

URU



DIMENSION PUBLISHING SDN. BHD. (449732-T) Level 18-01-02, PIX-HM Shah Tower, No. 16A, Persiaran Barat, 46050 Petaling Jaya, Selangor Darul Ehsan, Malaysia. Tel: +(603) 7493 1049 Fax: +(603) 7493 1047 E-mail: info@dimensionpublishing.com Website: www.dimensionpublishing.com

Chairman ROBERT MEBRUER

CEO/Publisher PATRICK LEUNG

General Manager SHIRLEY THAM shirley@dimensionpublishing.com

Head of Marketing & Business Development JOSEPH HOW joseph@dimensionpublishing.com

Production Editor TAN BEE HONG

bee@dimension publishing.com

Contributing Writers PUTRI ZANINA & ZOE PHOON

putri@dimensionpublishing.com zoe@dimensionpublishina.com

Senior Graphic Designer SUMATHI MANOKARAN sumathi@dimensionpublishing.com

Graphic Designer NABEELA AHMAD beela@dimensionpublishing.com

Advertising Consultants THAM CHOON KIT

Accounts cum Admin Executive YEN YIN yenyin@dimensionpublishing.com

For advertisement placements and subscriptions, please contact:

DIMENSION PUBLISHING SDN. BHD. (449732-T) Level 18-01-02, PIX-HM Shah Tower, No.16A, Persiaran Barat, 46050 Petaling Jaya, Selangor Darul Ehsan, Malaysia. Tel: +(603) 7493 1049 Fax: +(603) 7493 1047 E-mail: info@dimensionpublishing.com

Subscription Department

E-mail: info@dimensionpublishing.com

Printed by

PERCETAKAN SKYLINE SDN. BHD. (135134-v) No. 35 - 37, Jalan 12/32B, TSI Business Industrial Park, Off Jalan Kepong, 52100 Kuala Lumpur.

Mailer

SM UNIQUE MAILING SERVICES SDN. BHD. (44277-w) 80, Jalan Nadchatiram Satu, Taman Taynton View, Cheras, 56000 Kuala Lumpur, Malaysia. Tel: +(603) 9132 9192

JURUTERA MONTHLY CIRCULATION: 22.500 COPIES

Submission or placement of articles in JURUTERA could be made to the:-

Chief Editor THE INSTITUTION OF ENGINEERS, MALAYSIA (IEM) Bangunan Ingenieur, Lots 60 & 62, Jalan 52/4, P.O. Box 223 (Jalan Sultan), 46720 Petaling Jaya, Selangor. Tel: +(603) 7968 4001/4002 Fax: +(603) 7957 7678 E-mail: pub@iem.org.my or sec@iem.org.my IEM Website: http://www.myiem.org.my

 $\ensuremath{\mathbb{C}}$ 2019, The Institution of Engineers, Malaysia (IEM) and Dimension Publishing Sdn. Bhd.

PUBLICATION DISCLAIMER

The publication has been compiled by both IEM and Dimension with great care and they disclaim any duty to investigate any products, process, services, designs and the like which may be described in this publication. The appearance of any information in this publication does not necessarily constitute endorsement by IEM and Dimension. There is no guarantee that the information in this publication is free from errors. IEM and Dimension do not necessarily agree with the statement or the opinion expressed in this publication.

COPYRIGHT

JURUTERA Bulletin of IEM is the official magazine of The Institution of Engineers, Malaysia (IEM) and is published by Dimension Publishing Sdn. Bhd. The Institution and the Publisher retain the copyright over all materials published in the magazine.

No part of this magazine may be reproduced and transmitted in any form or stored in any retrieval system of any nature without the prior written permission of IEM and the Publisher.

<u>editor's note</u>

by Ir. Razak Yakob Bulletin Editor



Salam & Hello All IEMers,

This is the 12th issue of *JURUTERA* that I have helped to produce. This completes my term as bulletin editor. It was a great experience and an eye opener to the complexities of publishing a technical magazine. It was fun but definitely requires a great deal of commitment. The responsibility was tremendous. It is time to say goodbye. Thank you for all the support.

This month, it is all about the AGM, Annual Dinner and more. Various parties put in great effort to produce a *JURUTERA* that reflects IEM's image every month. It's not easy to come up with something fresh, interesting and engaging as well as managing the expectations of what the bulletin is.

However, change is inevitable. We need to progress to be better. You read about how we need to be responsive to change, in President's Corner (April 2019).

The April issue was special because it commemorated our 60th Anniversary but we also missed a few major details. I cannot apologise enough to the parties involved; the mistakes were unintentional.

Lastly, on behalf of the Editorial Board, we wish all Barakah Ramadan. Let's continue to engineer our country to a greater height!

ERRATA

Error on Cover story entitled "The Institution of Engineers, MALAYSIA turns 60" published in JURUTERA April 2019 issue – PRESIDENTS OF THE IEM FROM 1959 to 2019 in Page 7.

PRESIDENTS	OF THE IEM FROM	1959 TO 2019

NAME	SESSION
Allahyarham Tan Sri Ir. (Dr) Haji Yusoff bin Haji Ibrahim	1959/62
Allahyarham Raja Tan Sri Ir. Zainal bin Raja Sulaiman	1962/64
Late Ir. Thean Lip Thong	1964/66
Late Tan Sri Datuk Ir. Prof. Dr Chin Fung Kee	1966/68
Late Ir. Ow Yang Hong Chiew	1968/69
Late Ir. Chan Peng Khuen	1969/70
Allahyarham Tan Sri Dato' (Dr) Ir. Haji Abu Zarim bin Haji Omar	1970/72
Late Academician Tan Sri Ir. (Dr) J. G. Daniel	1972/74
Allahyarham Tan Sri Datuk Ir. Haji Halaluddin bin Mohd. Ishak	1974/75
Late Ir. Chan Khee Pok	1975/77
Allahyarham Tan Sri Datuk Ir. Mahfoz bin Khalid	Apr-Dec 1977
Allahyarham Ir.Tuan Haji Mohd. Razali bin Bidin	1977/79
Late Ir. Wong Kin Hong	1979/81
Late Ir. Chiam Teong Tee	1981/82
Allahyarham Tan Sri Datuk Ir. Haji Mohd. Hassan bin Abdul Wahab	1982/84
Y.Bhg. Dato' Ir. Pang Leong Hoon	1984/86
Allahyarham Ir.Tuan Haji Abdul Rahman bin Yaacob	1986/88
Y.Bhg. Academician Dato' Ir. Lee Yee Cheong	1988/90
Allahyarham Dato' Ir. Mustafa bin Ahmad	1990/92
Ir. Chong Pick Eng (P.E. Chong)	1992/93
Y.Bhg. Dato' Ir. Abdul Rashid bin Ahmad	1993/95
Ir. Dr Ting Wen Hui	1995/97
Ir. Tuan Haji Mohd. Mazlan bin Md. Ismail Merican	1997/99
Y.Bhg. Academician Tan Sri Datuk Ir. (Dr) Haji Ahmad Zaidee bin Laidin	1999/01
Y.Bhg. Dato' Ir. Dr Gue See Sew	2001/03
Y.Bhg. Dato' Ir. Prof. Abang Abdullah bin Abang Ali	2003/05
Y.Bhg. Datuk Ir. Prof. Dr Ow Chee Sheng	2005/07
Y.Bhg. Dato' Paduka Ir. Prof. (Dr) Haji Keizrul bin Abdullah	2007/09
Y.Bhg. Academician Dato' Ir. Prof. Dr Chuah Hean Teik	2009/11
Ir. Vincent Chen Kim Kieong	2011/13
Ir. Choo Kok Beng	2013/14
Y.Bhg. Dato' Ir. Lim Chow Hock	2014/16
Ir. Dr Tan Yean Chin	2016/18

The error is much regretted.



iem 60th ANNUAL DINNER & AWARDS NITE 2019

IEM 60⁴⁶ ANNIVERSARY DINNER AND AWARDS NIGHT 2019 "60 YEARS OF ENGINEERING THE NATION"

IEM President, Past Presidents and Vice Presidents on stage with Y.B. Teresa Kok for cake cutting ceremony





April, 2019, marked another milestone in the history of IEM as one of the largest professional institutions in Malaysia celebrated its 60th anniversary.

Its 60th Annual Dinner & Awards Nite kicked off with the guest of honour, Y.B. Teresa Kok, Minister of Primary Industries, Malaysia, launching the event by starting a video montage via a panel on Ella, the humanoid sponsored by the Asia Pacific University.

IEM greatly appreciated the attendance of Teresa Kok who had agreed to grace the event at the very last minute. She came in place of Y.A.B. Tun Dr Mahathir Mohamad who could not attend the event due to urgent pressing matters of the nation. She started her speech by saying that she believed the Prime Minister would have loved to be present as he was a technology enthusiast and would have been excited to be sharing ideas with the engineers.

While the first two courses of the dinner was being served, Grace Tan, an international LED violinist and speed painter, went on stage to draw a portrait of the guest of honour. This was presented to Teresa Kok by IEM President Ir. David Lai Kong Phooi.

With the theme, "60 years of Engineering the Nation" the evening saw IEM's Past Presidents gathering on stage to witness the cake-cutting ceremony. Ten of 15 Past Presidents were present to celebrate the historic moment, along with the newly elected and appointed top office bearers and council members.

A number of awards were presented in recognition of notable individuals and organisations which had contributed to the profession and the nation. Two senior members of IEM, Y.Bhg. Dato' Ir. Lim Chow Hock, IEM Past President and the late Ir. MC Hee, were conferred the IEM Honorary Fellow in recognition of their achievements and contributions to IEM, the nation and the engineering profession. The conferment on the late Ir. Hee was received on his behalf by his former student, Mr. Daniel Looi Ting Wee.

Y.Bhg. Academician Dato' Ir. Prof. Dr Chuah Hean Teik was inducted to the IEM Engineering Hall of Fame making him the ninth and youngest engineer to be admitted to the Malaysia Engineering Hall of Fame.



There were three winners for the Contribution to Engineering Industry Award this year:

Power & Energy Category	Gading Kencana Sdn. Bhd.	
Construction & Property	Compace Industrian Sdp. Phd	
Development Category	Cemsear mausifies san. Bha.	
Consultancy Engineering	Sepakat Setia Perunding	
Practice Category	Sdn. Bhd.	

The award ceremony continued with the IEM Gold Medal Awards to top engineering students for year 2018. This award had gained a great deal of attention from both public and private universities and this year, a record 35 top engineering students from local universities were present to receive their Gold Medal. The names are listed below.

LISTING OF IEM GOLD AWARDS 2019

NO.	NAME	UNIVERSITY
1.	Angel Mah Xin Yee	NOTTHINGHAM
2.	Azzamuddin bin Azizuddin	UITM
3.	Cheah Yi Ben	USM
4.	Chong Soon Hee	HERRIOT-WATT
5.	Deena Diyana binti Mustaffa Kamal	UM
6.	Gan Zi Xiang	KDU
7.	Geeventrarao Chandrasegaran	NILAI
8.	Heng Tze Khai	MONASH
9.	Ho Jaan Ee	CURTIN
10.	Hoo Kai Wei	UNITEN
11.	Jamilah binti Sariau	UMS
12.	Jasman Chai Yi Hao	SWINBURNE
13.	Kelvin Juing anak Tinggom	UNIMAS
14.	Koi Zi Kang	UTP
15.	Lau Teng Hui	UNIMAP
16.	Melanie Yong Ze Siin	TAYLORS
17.	Melchizedek a/l Moody Nehemiah	INTI
18.	Mohamad Syafiq bin Mazli	IIUM
19.	Mohamed Shafeer Mohamed Althaf	UCSI
20.	Mohd Amirul Hadi bin Rosli	UKM
21.	Namani Srilahari	AIMST
22.	Nurfarahdiana binti Abd Rahim	IUKL
23.	Ong Kevin	TARC
24.	Ow Yee Seng	MMU
25.	Siti Nadhirah binti Zainurin	USIM
26.	Siti Zubaidah binti Mohd Nasir	UPNM
27.	Tan Boon Siang	UTM
28.	Tan Kok Sian	UTeM
29.	Tjong Tze Jiet	MAHSA
30.	Uvaraja a/I Rajah	MANIPAL
31.	Wong Shy Kit	UPM
32.	Wong Wan Ying	UTAR
33.	Yap Ban Ho	SEGi
34.	Yii Ming Hong	UCTS
35.	Yim Jun Ming	APU



As part of IEM's appreciation to members and organisations that has effectively supported IEM in membership drive activities for the year 2018, IEM presented the following members and organisations with the Top Membership Drive Award:

Graduate Membership (Individual category)	Ir. Chan Cheong Loong
Graduate Membership (Organisation category)	Prasarana Sdn. Bhd.
Corporate Membership (Individual category)	Ir. Gopal Narian Kutty
Corporate Membership (Organisation category)	Jabatan Kerja Raya Malaysia
Most Active Organisation in support of IEM activities	Halfen Moment Sdn. Bhd.

The IEM Annual Dinner and Awards Night would have not be the same, if the hardworking IEM Technical Divisions were not given due recognition for their efforts in organising activities for the benefit of IEM members in their professional development. The following top Technical Divisions were congratulated for their relentless efforts.

Champion	Electrical Engineering Technical Divisions
First Punner Lln	Geotechnical Engineering
	Technical Division
Second Punner Un	Civil and Structural Engineering
	Technical Division
Third Runner Up	Building Services Technical Division
Fourth Runner Up	Women Engineers Section
Most Improved	Agricultural and Food Engineering
Technical Division	Technical Division

The Electrical Engineering Technical Division was Champion for the second consecutive year while the Agricultural & Food Engineering Technical Division celebrated their first win. Another first time winner was



SIKA SOLUTIONS FOR BRIDGE

Sika solutions can solve many challenges in bridge construction:

- Concrete admixture technology
- Concrete repairs replacement mortars
- Concrete protection
- Steel corrosion protection
- Structural strengthening
- Waterproofing bridge decks
- Grouting and fixing
- Structural bonding at bridge segment
- Joint sealing at bridge segment

SIKA KIMIA SDN BHD Lot 689, Nilai Industrial Estate, 71800 Nilai, Negeri Sembilan Phone: +6017 877 2310 · Fax: +603 7956 7291 www.sika.com.my



BUILDING TRUST



the Women Engineers Section for a well-organised major event that gained international attention, the Women in Science, Engineering & Technology Conference in 2018 with participation from women around the world.

This year saw the return of Malaysia's Jazz Queen, Datuk Sheila Majid, who gave an impeccable performance that awed the crowd. The guests responded with great enthusiasm to her outstanding performance. She's a true professional who has entertained us for more than 30 years.

As part of the 60th anniversary celebration this year, the Organising Committee not only increased the number of lucky draw prizes from the usual three to ten lucky winners but for the very first time, the draw of the lucky winner was performed using the new technology of face recognition replacing the previous number picking from the ticket stub in a box or bowl. The guests were kept on edge of their seats while they waited for the photograph of the winner to appear on the screens around the large dining hall. Prizes ranged from mobile phones, tablets and health tracker watches to electric bicycles, smart TVs and travel package. This exciting segment closed the evening with a cannon confetti and good night to the guests.

Earlier the same morning was the more serious 60th Annual General Meeting, another historical moment that saw a record attendance of 443 members. In addition to the usual business of presenting the annual report, the financial statements and election results, awards and recognitions were also presented.

In a day of setting records, for the first time, 28 members who were transferred to the grade of Fellow attended the AGM to receive their certificates from the President. In addition, the award for Best Technical Paper was also presented to the following members:

(i) The Tan Sri Hj. Yusoff Prize (awarded for an outstanding technical paper on any subject contributed by Corporate Members of the IEM).

CATEGORY	WINNER	PAPER TITLE
Civil	Ir. Dr Ooi Teik Aun	The present and future sustainable use of underground space in Malaysia
Engineering Education	Ir. Rocky Wong Hon Thang	WA-OBE approach - A practitioner's Perspective

(ii) The Raja Tan Sri Zainal Prize (awarded for an outstanding technical paper on any subject contributed by Graduate Members of the IEM).



CATEGORY	WINNER	PAPER TITLE
Electrical	Dr Siow Chun Lim	The AEI Electrical Blueprint: Towards ASEANising ASEAN Graduate Engineers
Civil	Dr Boon Chia Weng	Ground response due to underground construction and impact to 3rd party structures"
General	Dr Habibah Haron	Grooming future scientists and engineers from the root through fun learning concept"

The Tan Sri Ir. Hj. Yusoff Ibrahim Final Year Project winners also received their prizes during the AGM (refer list below):

OVERALL WINNER	Siti Nadhirah bt Zainurin	Universiti Sains Islam Malaysia (USIM) for her project entitled "Integration of radio over free space optic under Malaysian atmospheric disturbances using optisystem for wireless communication"	
	Koay Mei Yuan	TAR University College	
	Loong Ji Wei	University Nottingham Malaysia	
PRIZE WINNERS	Johnathan Goh Yue Herng	Monash University, Malaysia	
	Mohd Fazri bin Sedan	Universiti Putra Malaysia	

Last year, IEM started the rebranding exercise of the Log Book Training Scheme (LBTS) which is now called Engineering Competency Development (ECD). One of rebranding elements is mentor appreciation. This year IEM showed its appreciation to the 5 top mentors in 2018, based on their mentees' proposal submission. This is the start of an annual appreciation award to the mentors who have sacrificed much of their personal time to provide guidance to Graduate members who do not have professional engineers with the same discipline in their own organisations to be their mentor. The IEM 5 Top Mentors 2018 are:

NO.	NAME	MEMBERSHIP NO.	DISCIPLINE
1.	Ir. Yong Shu Hwa	M 28976	Chemical
2.	Ir. Sam Siong Won	M 17074	Electronic
3.	Ir. Chuah Rhun Riang	M 26229	Electrical
4.	Ir. Lee Lam	F 01998	Mechanical
5.	lr. Bhuvendhraa Rudrusamy	F 26383	Electronic

The AGM ended with the presentation of the Presidential Address 2019, "Engineering the Nation", by IEM President Ir. David Lai Kong Phooi (see bulletin for full speech text).





WATERPROOFING SYSTEMS FOR BELOW-GRADE STRUCTURES



Pre-formed Membranes Mapeproof, Mapeproof Mastic, Mapeproof Seal, Mapeproof Swell, Polystick TU Plus

Mortars & Coatings Mapelastic Foundation

Injections Mapegel UTT System

Joint Sealing Idrostop Tuboflex, Idrostop SW

Polyurea Membranes Purtop 1000, Purtop 400 M



Follow us on social media @MapeiMalaysia

HQ 03-7842 9098 | JB 07-595 3032 | Penang 04-642 9098 | Kuching 082-246 660 | www.mapei.com.my





Ir. David Lai Kong Phooi (2019/2020)

Ir. David Lai Kong Phooi is the President of The Institution of Engineers, Malaysia (IEM), Board Member of the Board of Engineers Malaysia (BEM) for 2016-2017, currently Board Member of Malaysian Standards and Accreditation Council and Past Chairman of the IEM Perak Branch. He held the position of Chairman of BEM IT Committee, Alternative Chairman of the BEM Application Committee, Member of the BEM National Monitoring Committee and is currently the Chairman of BEM Scale of Fee.

Ir. David Lai obtained his Bachelor of Science Degree with Honours in Civil Engineering from The City University, London in 1980. He later pursued the Executive Finance & Management Programme at the Golden Gate University, San Francisco USA (1987) and the Project Management Programme at the School of Housing, Building and Planning at University Sains Malaysia, Penang (2000) and Legal Studies External Programme at the University of London (2010).

Ir. David Lai is a Chartered Professional Engineer with Practicing Certificate (PEPC) registered with the BEM as well as the Board of Engineers Australia. He is an Honorary Fellow of the ASEAN Federation of Engineering Organisations (AFEO), ASEAN Chartered Professional Engineer (ACPE), Fellow of IEM, Fellow of The Institution of Engineers Australia and Registered Foreign Professional Engineer RFPE (Myanmar). He is also an APEC Engineer and an International Professional Engineer (IntPE). He has served as Senior Member of the Advocates & Solicitors Disciplinary Board of The BAR Council Malaysia since 2008, as an Adjunct Lecturer to University Technology Petronas in 2008 and currently served as the Industry Advisory Panel Member, Faculty of Civil Engineering at Monash University Malaysia.

Ir. David Lai has served IEM in the following positions:

- 1. Deputy President (2016 2018)
- 2. Vice President (2013 2016)
- 3. Council member (2002 2018)
- 4. Chairman of Finance Committee (2016 2018)
- 5. Chairman of Standing Committee on Welfare and Service Matters (2014 - 2015)
- 6. Chairman of Standing Committee on Information & Publications (2013 - 2014)
- 7. Vice-Chairman of Standing Committee on Corporate Affairs (2010 - 2012)
- 8. Member of the Standing Committee on Professional Practice (2010 - 2011)
- 9. Member of the Standing Committee on Education & Training (2008 - 2011)
- 10. Member of Standing Committee on Qualifications & Admissions (2004 - 2006)
- 11. Board Chairman of IEM Training Centre Sdn. Bhd.
- 12. Board Chairman of IEM Academy Sdn. Bhd.



Ir. David Lai started his working experience as a Highway Design Engineer with a United Kingdom-based Civil and Architectural consultancy firm in London and later served with the Government as a PWD District Engineer in Ipoh and Taiping, Perak. Thereafter, he served as the Project Director of a Civil Engineering firm majoring in Design and Built packages in main water supply projects and elevated water retaining structures and as the Project Director of a Developer Company. He is currently the Director of Perunding Muhibbah, a multi-civil, structural and project rehabilitation consultancy firm.

Ir. David Lai served as the Senior Ipoh City Hall's (MBI) Councillor for 7 years (2009 - 2016) and had served as the Deputy Chairman for the Project Privatisation, Road and Traffic and Community Committees; as well as Member of the Tender, Planning OSC, Finance, Town Cleanliness and Special Project Task Force Committees. He represented MBI in the ASIAN Mayor Conference in Nanning, China in 2015 and was accorded the winner of the Outstanding City Councillor KPI Achiever Award, MBI in 2013.

Ir. David Lai's hobbies include golf, swimming, mountain tracking, hunting, travelling, reading and playing musical instruments.

ENGINEERING THE NATION

Respected Past Presidents, Immediate Past President, Deputy President, Council Members and fellow engineers.

Twelve months ago, I addressed you in this same auditorium in conjunction with IEM's 59th Annual General Meeting. I wish to take this opportunity to express my sincere gratitude to the IEM Council for 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 amazed 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.

MY FELLOW ENGINEERS,

It is indeed an historical moment for IEM as we celebrate our 60th year. Our Institution has grown from a humble beginning with 60 members in 1959 to more than 50,000 members today. As it grows both in strength and stature, IEM has gained recognition both locally and internationally as a respected professional organisation and has continued to engineer the Nation.

This being our diamond anniversary, it is opportune to review the accomplishments of the institution and to offer recognition to those who have laid the foundation for what the institution is today. An understanding of our past will assist us to charting a plan of action towards a healthy, vibrant and prestigious profession, contributing towards the progress and success of our country.

IEM was first established in 1959 by The Late Ir. Tan Sri Yusoff Haji Ibrahim who became the first President. This was just 20 months after the country achieved independence in 1957. Thereafter, thirty-three distinguished and eminent engineers from different segments of the engineering fraternity including the public, private and academic sectors have served as Presidents of IEM. Among their many outstanding qualities, IEM's Past Presidents are remembered as persons of high integrity and strong principles, which are qualities that form the moral backbone of our Engineering profession.

Over the last 60 years, IEM has maintained a growing membership of engineers in Malaysia with the objective of promoting professionalism amongst members of the engineering fraternity in the country. Engineers have contributed substantially to the development of the country and are expected to continue playing a pivotal role in the future.

Members of IEM have in one way or another contributed to the development of the nation, as their work are involved in all sectors of the economy and of society. They have been the prime movers for the world class infrastructures, the utility networks and the production facilities that have been the foundation of our nation's development and which have made our lives convenient, safe and comfortable. In many cases, our engineers have achieved the capability to undertake international projects thus playing a significant role in the export of engineering services.

MY FELLOW ENGINEERS,

I would now like to share with you my continued mission and vision for the Institution.

1. STRENGTHENING THE BOND WITH IEM BRANCHES

Last year, I had deliberated at length the issue of strengthening our bond with the IEM Branches. As we are all aware, in addition to the Headquarters in Petaling Jaya, Selangor, IEM has twelve branches throughout Peninsular Malaysia as well as Sabah and Sarawak. Therefore, during the past session I have taken the opportunity engage with the Branches with the objective of aligning their aspirations, agenda and activities with those of IEM Headquarters. My target is to build in them the trust and esprit de corps that is the basis of a strong, united organisation.

I believe that the IEM Branches and the IEM Headquarters share the same objectives and challenges. For IEM to succeed and to be able to serve the needs of our members and the engineering fraternity, we must work together as one and not as disparate entities. We must integrate holistically the workings of Branches and the Headquarters. This will be achieved not through greater control but through dialogue, transparency and collaboration which will pave the way for greater autonomy at the Branch level in a rule-based system of management.

Since taking office, I have visited all the twelve IEM Branches namely IEM Sarawak, Miri, Sabah, Kedah-Perlis, Penang, Kelantan, Terengganu, Perak, Negeri Sembilan, Melaka, Pahang and Southern; while being mindful to incur minimal costs. On each visit, I found that engagement with members was productive and memorable, due largely to the dedicated purpose of each visit. At each Branch meeting, I focused on four important areas of engagement:

- 1. To listen to the views and opinions of the Branch committees.
- To consolidate all Branch and HQ accounts as required by the Registrar of Societies. This will require all Branches to shift their financial year to end on 31 December, to be in line with the HQ financial year. To facilitate this, a common accounting software system, MYOB, will be used in the HQ and all Branches.
- 3. Subscription income: This has been identified as a major contributor to the financial well-being of IEM. Increasing subscriptions through new memberships and arresting arrears of current members are therefore, major issues that must be addressed. Branch committees have been requested to assist in collecting arrears which have been increasing at an alarming rate.

4. Due to the prevailing economic conditions, IEM's cash flow has dipped into negative territory due to reduced income and rising expenses. Under such circumstances, there is a compelling need to re-examine our operations to increase income and reduce expenses wherever possible.

One key message brought to the Branches was the urgency to exercise extreme prudence in expenditure and to think of new ways to generate income. The enormous task of dealing with IEM's current financial situation means very tight resources are left for other important matters.

Therefore, it is incumbent for Branches to exercise empathy with and to stand by the IEM Headquarters in tackling the daunting tasks ahead. It requires no less than a shift in mind-set to understand that all activities, wherever they are held, are part of our overall aspirations towards a common goal. It is my ardent hope that together, we will make that happen.

MY FELLOW ENGINEERS,

2. VOLUNTEERISM - A VITAL KEY TO THE INSTITUTION'S SUCCESS

IEM's success for the past sixty years is made possible by our dedicated members who serve on the Council, Committees and Technical Divisions both at the IEM Headquarters and IEM Branches. IEM volunteers work together as a team, sharing their skills and sacrificing their time to work for the benefit of other members. Sixty years on, I am happy to observe that the spirit of volunteerism is very much alive in IEM.

This calls to my mind the words of the 19th century American novelist and poet of the American Renaissance period, Herman Melville:

"We cannot live only for ourselves. A thousand fibres connect us with our fellow men."

By volunteering to serve in IEM, members are able to be proactive in effecting positive changes for the good of the engineering profession in the country. The various Committees and Sub-committees in the IEM will always welcome such participation, commitment, and enthusiasm from its members. The basic criteria needed are to be sincerely committed to the betterment of the Institution, and subscribing to the basic noble values of excellence, creativity and professionalism. By participating actively in the running of the Institution too, members could train themselves in leadership and management skills, apart from the non-technical skills mentioned above.

Through volunteerism, members would be able to meet engineers of all disciplines, from various sectors, of all levels and age, and from all over the world, as the activities of IEM are not confined to Malaysia or Asia alone. These are means of developing a broader outlook, sharpening their communication and social skills.

With this in mind, it is crucial for us to inculcate the spirit of volunteerism in young engineers who will be taking over the leadership of IEM to move it further in the future. I am also happy to inform that since the last Annual General Meeting held last year, IEM's Constitution and Bylaws have been amended to allow for five (5) Companion/Graduate members and One (1) Woman Engineer to serve in Council. Therefore, I call upon more YES Members to volunteer and to help shape the institution and the profession at large.



A majority of YES members belong to younger age group of mostly below 40 years of age. With their participation in main committees of IEM, they will be able to rejuvenate and bring in new ideas to IEM. This in turn will help IEM to attract and cater for the younger generation of engineers.

I am inspired by the words of Dinesh Paliwal, President and CEO of HARMAN, a wholly-owned subsidiary of Samsung Electronics:

I believe that we all have a responsibility to give back. No one becomes successful without lots of hard work, support from others, and a little luck. Giving back creates a virtuous cycle that makes everyone more successful. Giving back to the communities and institutions that helped us achieve success is a value we share and a privilege we embrace.

In the same vein, I would like to invite our elder engineers to share their wealth of experience with the Institution. Such senior members may have retired from active service, but many continue to be active and make significant contributions to the engineering profession and the society which can be tapped by the Institution in the many areas where volunteers are needed.

MY FELLOW ENGINEERS,

3. IEM AS A STRATEGIC PARTNER FOR LOCAL AND FOREIGN ORGANISATIONS

In terms of liberalisation of engineering services and engineering mobility, IEM is a good platform for engineers to market themselves abroad. IEM under its various committees have embarked on many initiatives to facilitate business networking between our members who are engaged in business locally and overseas.

As the permanent secretariat of the ASEAN Federation of Engineering Institutions (AFEO) and the ASEAN Engineering Register (AER), IEM opens up opportunities for our members to joint-venture with ASEAN engineering firms and expand their network overseas. As a constituent member of FEIAP, WFEO, and FEIIC, IEM is able to facilitate cross-border mobility of engineering services of Malaysian engineers globally.

IEM has also embarked on bilateral relations with various overseas engineering institutions. To-date, IEM has signed 25 MoUs with engineering institutions with a view to promote, facilitate and extend professional and social links between the foreign engineering institutions and IEM, to the benefit

of members of the signatory organisations and to assist in advancing the mobility of engineering practitioners and the quality of engineering practice worldwide.



Taking this one step further, IEM could serve as a strategic partner for overseas engineering organisations. One possible aspect for such collaboration is the provision of training and capacity building for the international engineering fraternity. As engineers, we play an important role in leading and transforming the quality of people's lives. Globalisation of our economies and integration of Engineering Services cross-border will play a dominant and decisive role in meeting this goal.

With proper capacity building, training and skills, engineers and engineering technologists in the region and beyond will be able to bridge the development gaps in their respective countries and ultimately play an instrumental role in the cross-border development that will enhance the quality life for not only the their people but also those beyond.

Thus, as a strategic partner for training and capacity building, IEM together with its overseas counterpart would become an important vehicle in elevating the engineering skills amongst its respective members as well as the wider engineering populace in both countries.

MY FELLOW ENGINEERS,

4. CONNECTING WITH GOVERNMENT AGENCIES AND MINISTRIES

Over the past 60 years, IEM has continued to Engineer the Nation by providing engineering and technical advice to the relevant government agencies and authorities both at state and federal levels. Indeed, our membership has provided a good avenue for federal and state governments to source for professional opinions, commentary or advice on various engineering issues.

This premise holds true even with the recent change in government. Premised on the principles of good governance, strong institutions and integrity, the new Government has affirmed the goal for Malaysia to become a developed and inclusive nation. Therefore, to ensure engineers have a crucial part to play in the new Government's development goals for the country, during the past session, my team and I have initiated dialogues with the following Ministries and government agencies and several more are in the pipeline for this Session:

- Prime Minister of Malaysia YAB Tun Dr Mahathir Mohamad
- Minister of Energy, Science, Technology, Environment & Climate Change (MESTECC) YB Yeo Bee Yin
- Minister of International Trade and Industry (MITI) YB Datuk Ignatius Darell Leiking
- Chief Minister of Penang YAB Tuan Chow Kon Yeow
- Secretary General of the Ministry of International Trade and Industry (MITI) Datuk Seri J. Jayasiri
- Secretary General of the then Ministry of Energy, Green Technology and Water (KeTTHA) Datuk Seri Ir. Dr Zaini Ujang
- Chairman of the Construction Industry Development Board Malaysia (CIDB) Y.Bhg. Tan Sri Dr Ir. Ahmad Tajuddin Ali
- Dewan Bandaraya Kota Kinabalu (DBKK) Director General Datuk Ir. Hj Amrullah @ Ambrullah Kamal
- Finance Minister Y.B. Lim Guan Eng
- Minister of Youth, Y.B. Syed Saddiq Syed Abdul Rahman
- Minister of Primary Industries, Y.B. Puan Teresa Kok

To continue Engineering the Nation, engineers must work hand-in-hand with government agencies to develop new or enhance existing guidelines and regulations pertaining to engineering matters. As the champion and mouthpiece of the engineering fraternity, IEM must constantly work in collaboration with experienced engineers, industry players, various government departments, institutions and universities.

It is pertinent that our engineers get involved in forums initiated by the Government and relevant Institutions when called upon for negotiations and exchange of ideas and strengthening capacity building in sustainable construction and development. In essence, we should improve the mechanisms to facilitate effective implementation of sustainable development strategies.

CONCLUSION

MY FELLOW ENGINEERS,

For an Institution that will last for generations, 60 years is just a milestone. Without a doubt, it is through our collective efforts and support that our beloved Institution has withstood the test of time. It is also because of the hard work and dedication of our volunteers, members and secretariat that our membership has been able to grow and our Institution to develop over the past six decades.

Now we need to look to the time to come. To continue our focus on Engineering the Nation way into the future, we need to continue enhancing the engineering capabilities of our members and a thriving engineering ecosystem, with the Government, the private sector, academic institutions working closely together with IEM. Therefore, I call upon all of you to join forces with me as we embark on the next course of our journey together in The Institution of Engineers, Malaysia.

15

May our efforts towards this mission shall prevail. Thank You.

Ir. David Lai Kong Phooi

IEM President, Session 2019/2020

MAY 2019 THE INSTITUTION OF ENGINEERS, MALAYSIA JURUTERA



NETWORKING WITH IEM MAXIMISING YOUR BENEFITS AS A MEMBER

s The Institution of Engineers, Malaysia (IEM) forges ahead after celebrating its 60th anniversary in April 2019, there are still many members who are unaware of the innumerable benefits that are available for them.

Besides tapping into its technical programmes and non-technical activities for their development and total well-being, its members which stood at 50,366 on 30 April 2019 do not seem to realise that they can draw on the rich connections which IEM can offer for their career advancement or development.

As a premier professional organisation, the Institution is linked to many outside bodies, both local and foreign, thus providing tremendous networking opportunities for its members. The list includes professional institutions, associations, private training companies, universities, government linked companies and agencies as well as corporations from various industries.

Such networking platform is a fillip to its members, keeping them abreast with the rapid technological changes taking place globally and connecting them to the key industry players and relevant parties concerned. The benefits of IEM's networking initiatives are explained here to provide members with a better insight of IEM's efforts to help its members.

INTERNATIONAL NETWORKING OPPORTUNITIES AND MOBILITY

IEM has been actively engaging with numerous international initiatives with the aim of promoting Malaysia and Malaysian engineers internationally. One of the most actively participated initiative is the ASEAN Federation of Engineering Organisations (AFEO). The initiative was formed by the engineering bodies of the ten ASEAN countries since February 1980 and IEM is a founding member. The representatives of the ten member organisations meet twice a year – a Mid Term Governing Board meeting middle of the year and a year-end conference. The year-end conference known as CAFEO is normally participated by more than 1,000 engineers from all the ten member nations. They get together to exchange ideas, set up contacts or promote their services etc. The ten member nations take turns to host the conference.

In recent years, exhibitions had also been arranged during the conference to enable the engineering firms from the member nations to showcase their products and services. For the last two years, IEM has teamed up with MATRADE (Malaysia External Trade Development Corporation) to promote export of services from Malaysia. MATRADE provides a grant for eligible engineering companies – to showcase their products and services at the Malaysian pavilion at the exhibition. The companies are eligible to claim for reimbursement of expenses incurred at the exhibition up to a maximum of RM10,000. In 2018, ten (10) companies participated in the exhibition at the Malaysia Pavilion during CAFEO38 in Singapore. The next event will be in Jakarta in September 2019. Members who are interested may contact Ms. Valli of the IEM International office at 03-79684010. IEM will continue to seek MATRADE's support for IEM members to benefit from this initiative.

As part of IEM's effort to promote mobility of engineers in ASEAN, the ASEAN Engineering Register was established in 23 November 1998 where the database of engineers in the register is made available online to the member nations. Professional engineers, Graduate engineers and consultants are able to put up their information in this database for expansion of their business or services. IEM members need to pay only a small fee to be listed in this register which is open to all the ten ASEAN member nations. The database can be accessed from the IEM website at www.myiem.org.my.

Today, ASEAN is also an expanding market and IEM members can have more exposure to this growing market via the AFEO/AER.



Besides ASEAN, IEM is also very active in the Asia Pacific region being a member economy of the Federation of Engineering Institutions of Asia and the Pacific (FEIAP in brief). FEIAP is an international non-profit professional organisation founded on 6 July 1978. It was established following an exploratory meeting convened and organised by The Engineering Institute of Thailand under The King's Patronage with the support of the United Nations Educational Scientific and Cultural Organization (UNESCO) on 3 July 1978 in Chiang Mai.



In 120 years, environmental exposure will be more aggressive. We have the solution, today.

oliMac®

WIRE PROTECTION FOR A CHANGING WORLD

New PoliMac[®] polymer coating for Gabions, Reno Mattresses and **Rockfall protections designed to last**

POLIMAC® PRODUCTS HAVE

IDENTIFICATION ON THEIR EDGE WIRES



BETTER RESISTANCE **POLYMERIC COATINGS**



🛗 🎔 in 🞯 maccaferri.com/polimac

www.maccaferri.com/my

Maccaferri (Malaysia) Sdn. Bhd. Unit 511, Block G, Phileo Damansara 1, No.9, Jalan 16/11, Off Jalan Damansara, 46350 Petaling Jaya, Selangor Darul Ehsan, Malaysia T +60-3 7955 7800 F +60-3 7955 7801



FEATURE

BUSINESS OPPORTUNITY IN ENVIRONMENTAL ENGINEERING

The principal of a long-established Environmental Engineering Company in Malaysia is seeking to divest his shareholding. The company has extensive experience in sewage treatment, air and water pollution control and treatment, solid waste handling and ancillary turnkey projects related to the reduction of environmental pollution. The principal is seeking a gradual divestment. Return of investment projected to be within four years. Interested parties are invited to discuss particulars by contacting the principal via *Phone/WhatsApp at* +6012 383 0564.







JOINT DISPOSAL OF WASTE WOOD AND WASTEWATER BY INCINERATION AND EVAPORATION







The ASEAN Handshake at CAFEO36 in Singapore in November 2018

Being an independent umbrella organisation for the engineering institutions in the Southeast Asia and the Pacific region, the objectives of FEIAP is to encourage the application of technical progress to economic and social advancement throughout the world; to advance engineering as a profession in the interest of all people; and to foster peace throughout the world.

FEIAP comprises the following member economies:

- Engineers Australia (EA)
- China Association for Science and Technology (CAST)
- Hong Kong Institution of Engineers (HKIE)
- The Institution of Engineers, Indonesia (PII)
- The Institution of Professional Engineers Japan (IPEJ)
- Korean Professional Engineers Association (KPEA)
- The Institution of Engineers, Malaysia (IEM)
- The Institution of Engineers, Papua New Guinea (IEPNG)
- Philippine Technological Council (PTC)
- The Engineering Institute of Thailand (EIT) under the King's Patronage
- The Institution of Engineers, Mauritius (IEM)
- The Institution of Engineers, Singapore (IES)
- Chinese Institute of Engineers, Chinese Taipei (CIE)
- Myanmar Engineering Society (MES) and Myanmar Engineering Council (MEngC)
- The Institution of Engineers, India (IEI)
- The Institution of Engineers, Bangladesh (IEB)
- Pakistan Engineering Council (PEC)
- The College of Engineers of Peru (CIP)
- National Association Engineers of Timor Leste (ANETL)
- American Association of Engineering Societies (AAES)
- The Institution of Engineers, Sri Lanka (IE Sri Lanka)
- The Council for the Regulation of Engineering in Nigeria (COREN)
- The Royal Netherlands Society of Engineers (KIVI)
- Nepal Engineers Association (NEA)
- The Institution of Engineers, Rwanda (IER)
- Iraqi Engineers Union (IEU)

FEIAP's role is to Incorporate an Accreditation System Model Framework adaptive to Needs of Member Economies, Provide Mentoring Assistance, Educate its Member Economies on Evaluation and Reviewing Accreditation Agency procedure and last but not least Provide training and guidance to local universities, Assessors of its Member economy. It aims to:

- help its member economies to be competitive and have engineers who are able to meet with global requirement.
- help the universities within the member economies to reach a standard acceptable globally.
- provide training and guidance to member economies to attain the acceptable standard.

Meetings are held twice a year to discuss activities to be organised to achieve the above aims. IEM members are therefore recognised as having achieved the required standards and qualifications in the member economies.



Besides FEIAP, IEM also maintains the APEC Engineers Register and the International Professional Engineers Register. Being admitted into these registers will also assist IEM members in cross border mobility for their businesses or careers. IEM first signed a Mutual Recognition Agreement with Engineers Australia in 2009 providing mutual recognition of membership between Engineers Australia and IEM. IEM members are able to be admitted as Members of Engineers Australia by completing a set of application forms which would need to be submitted together with a confirmation of status from IEM. No additional assessment would be required. This will enable the member to be registered as MIEAust. Nevertheless, a registered APEC Engineer will be exempted from Stage 1 competency assessment for registration as a Chartered Engineer in Australia. Find out more about this from IEM International office.

IEM is the Malaysian representative of the Federation of Engineering Institutions of Islamic Countries (FEIIC) which was established in May 1989. This initiative comprises 16 member countries and a number of corporate and institutional members from amongst academic and research institutions, consultants, contractors and other organisations. FEIIC is an international non-profit professional organisation, with the aim of fostering corporation in engineering education, research and professional practice in the Islamic Countries.

In order to contribute to international development, the federation was established to develop the engineering profession, sciences and their applications and to exchange technical data for the purpose of fully developing all the Islamic countries.

The objective of the FEIIC is to Promote Global Linkages and Network and to do that, a number of initiatives are being undertaken by the FEIIC Secretariat and Council namely:

- Develop database of expertise (e.g Who's Who)
- Improve Homepage
- Establish effective communication and strengthen Regional Offices
- Advance And Share Knowledge And Expertise
- Publish and maintain a high standard journal
- · Organise prestigious conferences, workshops and specialists training courses
- · Facilitate exchange of scholars
- Create study grants/awards
- Exploit information technology
- Formulate strategies and establish centres for R&D
- Establish specialist and national groups
- · Consolidate multipurpose international activities
- · Award and acknowledge prominent contribution
- Ensure continuous government support
- Create business opportunity
- Develop Leading Edge Technology and Industries
- Encourage industrial linkages
- Inculcate awareness in environmental issues
- Establish disaster and relief programmes
- Encourage sustainable resources utilisation in Islamic countries
- Enhance cooperation and manage human resource in Islamic countries

Other international initiatives which IEM is actively involved in includes WFEO (World Federation of Engineering Organisations) as well as APCChE (Asia Pacific Confederation of Chemical Engineers). In addition, twenty-three (23) Memorandums of Understanding had been signed with foreign bodies to facilitate recognition of IEM membership amongst which includes Institute of Electrical Engineers of Japan (IEEJ), Palestinian Union of Engineers (GUPE), Institution of Chemical Engineers United Kingdom (IChemE), The Institution of Engineers Sri Lanka (IESL), International Association for Hydro-Environment Engineering and Research United Kingdom (IAHR), Royal Netherlands Society of Engineers (KIVI), Institution of Civil Engineers United Kingdom (ICE), China Association for Science and Technology (CAST), Chinese Institute of Engineers



Monitoring, repairing and strengthening for structures

OVM

Nehemiah Prestress



Head Office Nehemiah Prestress Sdn Bhd annea No. 45-3, Jalan PJU 5/20 The Strand, Kota Damansara 47810 Petaling Jaya Selangor Darul Ehsan Malaysia Tel: (603) 6142 6638 Fax: (603) 6142 6693 Email: enquiry@nehemiahpt.com



JURUTER





MoU signing with China Association for Science and Technology (CAST) on 22 November 2018

(CIE) etc.The full list of MoUs can be obtained from the IEM website.

The IEM Women Engineers Section actively promotes Malaysian women engineers and their achievements or activities in the international initiatives. The IEM Women Engineers Section is represented in the International Network of Women Engineers and Scientists (INWES) via APNN (Asia Pacific Nation Network). The Chairman of the IEM Women Engineers Section also serve as the Secretary General of the Women Engineers of AFEO (WEAFEO).

As a member of INWES, each year the IEM Women Engineers Section (WE) invite applications from women engineer members of IEM to submit papers for presentation at the Korean Women Science Camp in Korea. It is a full sponsored participation and two candidates will be selected by the WE to attend this international camp to provide exposure as well as knowledge transfer for Malaysian young women engineers.

In addition, the IEMWE had been supporting the National STEM Movement (NSM) to promote STEM education in primary schools. Members of the WE jointly with the NSM hold talks, competitions or sharing sessions with primary school children to impress upon them the excitement of science and mathematics.

Women engineers who are interested to join the IEM WE Section or participate in their activities may contact the IEM Secretariat.

NETWORKING WITH LOCAL AUTHORITIES

In order to ensure that engineers are involved in nation building and the voice of engineers is heard during decision making meetings of the government, IEM had been offering its services to many local and government authorities. IEM members are appointed as members of Committees in various local government departments as well as federal government agencies.

IEM members also serve in Standards Writing Committees under SIRIM or Standards Malaysia to ensure that the views of engineers are taken into consideration in the drafting of various standards that affect the engineering profession. IEM members who are interested to offer their expertise or knowledge may write in to the IEM Honorary Secretary to volunteer.

Memorandums of Understanding had been signed with the following local municipal offices:

- 1. Majlis Bandaraya Petaling Jaya
- 2. Majlis Bandaraya Ipoh
- 3. Kota Kinabalu City Council
- 4. Majlis Bandaraya Melaka Bersejarah
- 5. Majlis Perbandaran Hang Tuah Jaya
- 6. Majlis Bandaraya Pulau Pinang
- 7. Majlis Perbandaran Seberang Prai
- 8. Dewan Bandaraya Kuala Lumpur
- 9. Majlis Bandaraya Miri (renewal)

IEM's participation is not limited to only government agencies as the engineers' involvement span across a broad spectrum of activities. IEM is invited to serve in many task forces, working groups of other bodies as well. IEM has five (5) representatives serving in the Board of Engineers, Malaysia (BEM) as well as members serving the Committees of the BEM. With this close relationship with BEM, IEM had been appointed as one of the organisations to conduct the Professional Assessment Examination (PAE) for the BEM as well as a Certifying Body for the implementation of the Continuing Professional Development (CPD) for Professional Engineers in Malaysia.

IEM's Past Presidents and Vice Presidents also has actively participates in a number of organisations such as CIDB (Construction Industry Development Board), MPC



Courtesy visit on 4 June 2018 by Engineers Australia comprising Mr. Jeff Hughes (General Manager, Member Services), Mr. Noel Dos Santos (Business Development Manager)



Miragrid[®]

Mirafi[®]

Geotube

beyond Oyeans GLOBAL LEADERSHIP IN GEOSYNTHETICS

with civil engineering solutions that enhance the world's infrastructure, protect the environment and conserve natural resources





Subgrade Stabilization

Miragrid

Reinforced Wall & Slope Polyfelt[®]

Ground Treatment

TenCate Geosynthetics Asia Sdn. Bhd. (264232-U)14, Jalan Sementa 27/91, Seksyen 27,40400 Shah Alam, Selangor Darul Ehsan, Malaysia.Tel: +60 3 5192 8568Fax: +60 3 5192 8568Fax: +60 3 5192 8575Email: info.asia@tencategeo.com









Dewan Bandaraya Kuala Lumpur 20 Sept 2016

(Malaysia Productivity Corporation), MBAM (Master Builders Association of Malaysia), Academy of Sciences, Malaysia (ASM), Malaysian Services Providers Confederation (MSPC) and many more.

IEM is also a member of the Building Industry Presidents' Council which includes representatives from Pertubuhan Akitek Malaysia (PAM), Master Builders Association, Malaysia (MBAM), Real Estate and Housing Developers' Association, Malaysia (REHDA) and The Royal Institution of Surveyors, Malaysia (RISM). The main intention of this Council is to ensure that regulations, Acts or laws affecting the building industry had taken into consideration views and opinions of those involved in these professions and would not be detrimental to the industries concerned.

As a representative in the MyNSC and MyENC of Standards Malaysia, the IEM President ensures that Committees drafting standards which affect the engineers would have input from IEM. Many members from the Technical Divisions of IEM serve in these Standards Writing Committees especially involving the electrical, mechanical and civil engineering disciplines.

IEM members had been actively in touch with the Ministry of Housing and Local Government in various initiatives such as the CITP IWG on energy efficiency implementation by 20 local authorities by the fourth guarter of 2020. IEM also collaborates closely with the Ministry of Energy, Green Technology and Water with many representatives involved in dialogues or meetings on subject matters such as the Efficient Management of Electrical Energy Regulations and Building Sector Energy Efficiency Regulation.



Courtesy visit to YB Yeo Bee Yin, Minister of Energy, Science, Technology, Environment & Climate Change (MESTECC) on 3rd August 2018



Majlis Perbandaran Subang Jaya 8 Sept 2016

IEM's close collaboration with MITI as well as MATRADE also assists engineers with export of services where the Ministry and MATRADE had recognised IEM for its engineering expertise and professional standards.

IEM also sends its representatives for committee meetings with the city councils, for instance in Melaka and Petaling Jaya last year to discuss management matters, provision of services and town planning.

From 2014-2018, IEM has also inked many MoUs to work with various local professional institutions, including CIDB so that its members can play a greater role in raising industry issues for the benefit of all. It encourages its members to give their opinions and be proactive in effecting positive changes for the good of the engineering profession particularly in Malaysia. See Table below.

MoUs WITH LOCAL PROFESSIONAL INSTITUTIONS 2014-2018

	Institution	Date Signed
1.	Construction Industry Development Board	14 Mar 2014
2.	Malaysian Steam & Internal Combustion Engine Engineer Association	6 Feb 2016
3.	Malaysian Geotechnical Society	22 Mar 2017
4.	The Electrical and Electronics Association of Malaysia	21 May 2017
5.	Malaysian Institute of Road Safety Research	11 Aug 2017
6.	Technological Association Malaysia (renewal)	4 Sep 2017
7.	Malaysian Oil & Gas Engineering Council	5 Oct 2017
8.	Project Management Institute Malaysia Chapter (renewal)	15 Jan 2018

IEM Membership

IEM members may check on the salient points of IEM's MoUs with foreign bodies from the IEM website at www.myiem.org under the tab International.



DEVELOPING ENGINEERING WORKFORCE, **DESIGNING A BETTER FUTURE**

3rd Ir. CHIAM TEONG TEE MEMORIAL LECTURE, DELIVERED BY ACADEMICIAN DATO' Ir. PROF. DR CHUAH HEAN TEIK





Ir. Dr Ooi Teik Aun

Ir. Dr Wang Hong Kok



The Speaker

Prof. Chuah Hean Teik, Senior Fellow of the Academy of Science, Malaysia, graduated with a B. Eng (First Class Honors) and went on to obtain a MEngSc and Ph. D in electrical engineering from University Malaya. Since April 2008, he has served as the President of Universiti Tunku Abdul Rahman (UTAR) and has authored/co-authored more than 260 papers in international journals and conferences. Academic achievements aside, Prof. Chuah is equally successful in his engineering practice. He was elected as President (2009-2011) of The Institution of Engineers, Malaysia (IEM) and served on the Board of Engineers, Malaysia (BEM) in various capacities. He is also a Council member of Malaysian Engineering Accreditation Council, and a Council member of Malaysian Qualification Agency.

One thing I have learned in a long life: that all our science, measured against reality, is primitive and childlike and yet is the most precious thing we have. ALBERT EINSTEIN

It's not technology changes the world. It's people using technology changes the world. JACK MA



Photo session with the speaker





Create the quiet efficient residential & commercial solutions



7 speeds indoor fan





Connectable





control





Sole Distributor: Midea Scott & English Electronics Sdn Bhd (194517-X)

 Middea Scott & English Electronics Sch Bhd (194517-X)

 No. 16, Jalan Chan Sow Lin, 55200 Kuala Lumpur

 Tel: 03-9221 1033
 Fax: 03-9221 7204 / 03-9221 1434 / 03-9221 3509

 • PENANG No. 35, Jalan Perniagaan Gemilang 1, Pusat Perniagaan Gemilang, 14000 Bukit Mertajam, Putau Pinang, Tel: 04-548 3938 Fax: 04-548 9698

 • JDHOR No. 25, Jalan Seri Impian 1, Taman Impian Emas, 81300 Skudal, Johor. Tel: 07-562 4989 Fax: 07-567 7898

 • MALACGA No. 385L, Taman Perningit Jaya, 75400 Peringgit, Metaka, Tel: 06-288 17107

 • PHANG No. 258, Ground Floor, Jalan Air Putih, Taman Air Putih Metaka, Tel: 06-288 17107

 • PERAK No. 38, Persiaran Perindustrian Pengkalan, 10, Kawasan Perindustrian Pengkalan, 31500 Lahat, Perak, Tel: 05-523 2529 Fax: 05-523 2529

 • SBABH Lot 3, Lorong Kompleks B5A, Kodmobong, 88450 Kota Kinabalu, Sabah. Tel: 08-421 428 Fax: 084-431 427

 • SBARM Lot 3, Lorong Kompleks B5A, Kodmobong, 88450 Kota Kinabalu, Sabah. Tel: 08-421 428 Fax: 082-368 167



🔘 midea_malaysia





n 23 March, 2019, Auditorium Professor Chin Fung Kee was packed with IEM members who had come to listen to Prof. Ir. Dr Chuah Hean Teik who delivered a 2-hour lecture. Those who turned up included IEM President Ir. David Lai, Past Presidents Dato' Ir. Pang Leong Hoon and Ir. Choo Kok Beng, Vice President Ir. Prof. Jeffery Chieng, Hon. Secretary Ir. Mohd. Khir, Council Members Ir. Yam Teong Sian, Ir. Dr Lee Yun Fook and Ir. Dr Jayaseelan Nadarajah and Past Hon. Secretary Ir. Yap Soon Hoe.

In his lecture, Prof. Chuah shared his thoughts on developing the engineering workforce to include the training of engineers, technologists and technicians. For this article, the authors would use a popular open system model (Mockler, 1968) in Section 2 to highlight the core concepts of the lecture which range from the evolution of digital engineering education and mobility of engineering workforce to other expected "soft traits" of the engineering workforce.

Are engineering education and engineering practitioners facing a big problem? Prof. Chuah certainly thinks so. See Figure 1 on the decline of Science, Technology, Engineering and Mathematics (STEM) enrolment.



Figure 1: STEM Enrolment Source: MOE, Malaysia Educational Statistics



Figure 2: Fewer Students Chose STEM vs Arts Source: MOE, Malaysia Educational Statistics





SIMPRO®

All in one

-to-use

Protective Relay Test System



What Can It Do For You?

The MIS-5100 is the most powerful all-in-one relay test system with a direct front panel interface for all functions, without exception! The ideal system for testing and calibrating protective relays using traditional test techniques or applying realistic power system simulations.

Easily test single overcurrent relays to multi-terminal end-to-end schemes with this one box. No add-ons. No hidden costs. The MTS-5100 includes all the power (VA) that you need for old electromechanical relays in each output channel to minimize connection changes, with all of the output current and voltage channels you need for modern microprocessor-based relays.

Powerful productivity functions and built-in intelligence make it a simple task to perform realistic power system simulations which increases productivity and effectiveness.

Features and Benefits



Direct front panel interface for all functions Exceptional productivity for common tasks All-in-one, no options required

- Very high VA current output chanels
- Realistic fault quantities and waveforms

MTS-5100

- 6 AC/DC Currents
 6x30Arms, 3x60Arms, 1x180Arms
- 4 AC/DC Voltages
 4x250Vrms, 1x750Vrms
- 12 Contact / 0-250Vrms Voltage inputs
- Transducer voltage/input
- USB Memory
- IEC 61850
- GPS input IRIG input IRIG output 4 Contact outputs

State of the Art Functions

Relay Specific Productivity Screens: Simplify the testing of various relay types with job done in the fewest number of steps.

Single Button Access for Steady-State Injections: Just one button from the main screen is the manual test screen, where you can immediately energize the outputs and test the device. Phase sequence, amplitude and frequency automatically follow to your pre-defined system defaults.

Intelligent Phase-Phase & 3-Phase Adjustment: For phasephase, just 3 parameters control phase-phase voltage, current and fault phase angle, changing appropriate amplitude and phase angle settings of outputs automatically in order to correctly simulate phase faults. Similarly, for 3-phase faults, changing the fault current, fault voltage and phase angle changes the outputs of all 3 phases simultaneously.

Ramping and State Sequencing: For rate-of-change of frequency relays, motor bus transfer schemes, or simply automatic pickup testing, ramp one or all parameters directly from the front panel. For reclosing scheme testing or evolving faults, set up multi-state tests directly from the front panel.

Capabilities

- 🗸 Steady-state testing
 - Dynamic testing step/ramp/state sequence
- Transient waveform testing
- GPS time synchronized testing



FEATURE



IEM members who attended the lecture

Out of 441,883 students who enrolled in Form One in 2012, about 189,447 students (48.6%) entered Science stream in Form Five in 2016. But in 2017, only 19.85%, or a paltry 37,627 students chose STEM in post-secondary schools.

Figure 2 shows a general but definitive decline of STEM among 15-yearold students between 2007 and 2017. For example in 2007, 50.5% of students enrolled in Arts, while 49.9% of students enrolled in STEM. In 2012 the figures were Arts (52.4%) and STEM (47.6%). The figures further declined in 2017 with Arts (54.9%) and STEM (45.1%). The growing lack of interest in STEM education is clearly evident.

Malaysia hopes to produce one engineer for every 100 people. Table 1, however, paints a pathetic ratio of 1:192, a far cry when compared to other Western countries.

COUNTRY	ENGINEER-POPULATION RATIO
France	1:75
Germany	1:85
Canada	1:120
United Kingdom	1:141
Malaysia	1:192

Table 1: Engineering-Population Ratio

Source: MOE, Malaysia Educational Statistics

In the context of globalisation, urbanisation, keen competition, knowledgebased digital economy, new emerging areas and human networking, a deeper appreciation of the role of engineering workers is needed and this is basically the aim of Prof. Chuah's lecture.

From his lecture, we focus on answering two questions in this report. First, what are the challenges facing the engineering workforce in the digital era? Second, what are the issues facing engineering educators?

CHALLENGES FACING THE ENGINEERING WORKFORCE

Basics of an open system. An open system model is actor-centric. The key is to see how the external environment can impact on the decision-making of an entity.

Such a model may be used to explain the current situation of the engineering workforce - Prof. Chuah noted that both the rapidly changing external environment (such as forces of globalisation, urbanisation, keen competition, digital engineering, mobility, etc.) and the stakeholders' influence in decision-making (government bodies, Institutions of Higher Learning (IHL), students, parents, engineering industry, etc.), can contribute to the quality of our engineering workforce.

He believed that we regard the engineering workforce as a collective good/ public good. Elinor Ostrom, a Nobel Prize co-winner of Economic Science in 2009, developed her famous model "Institutional Analysis Development" (IAD)



www.nehemiahwalls.com



framework to provide further insight into how to govern collective goods/public goods effectively.

Figure 3 shows the popular open system model, adapted from Robbins and Coulter (2012, p. 64). There are four dimensions in the model: Stakeholders as input, decision clusters involving the transformation process, context/environment and quality of engineering workers as output.

Input of stakeholders. The stakeholders are the government bodies, institutions of higher learning, students, parents and the engineering industry. The incentive structure, if done well by government bodies, can encourage more students to enroll in STEM. The prospects of employment too will affect the decision-making of parents and students.



Figure 3: Dynamics of Challenges Facing Engineering Workers Source: Adapted from Robbins and Coulter (2012, p. 64) **Transformation process**. Before enrolling in STEM, students and their parents will have to make a series of decisions.

- 1. Is the foundation adequately built to undertake STEM?
- 1. What are the career prospects?
- 2. What are the challenges awaiting STEM graduates?

To the third question, Prof. Chuah listed seven challenges

in the real world: Inequality, pollution, food shortages, energy consumption, global warming and climate change, health & ageing and security (physical space and cyber space).

Context/Environment. This dimension can be classified into four categories: Social, technological, economics and political (STEP) environments.

- 1. In the social environment, Prof. Chuah said change may happen at a faster pace; he foresees a borderless world and more opportunities of doing business.
- In the technological environment, citing rapid changes to the past technological revolution waves, he said "technologies are being embedded in societies and even human bodies in a whole new way".
- 3. In the economic environment, he painted an even worse scenario; in 2016, "the richest 10% adults hold 89% of world assets while the bottom half owned less than 1% of world assets".
- In the political environment, some countries may not be taking global warming and climate change seriously despite the clear threat to the survival of the human race.

Output of the engineering workforce. Prof. Chuah listed a total of 10 skills expected of our engineering workforce as

NOA

...empowers your power distribution system

PIONEER

IN INTEGRATED CBA + PDM DIAGNOSTIC ASSESSMENT SERVICES IN MALAYSIA

OUR SERVICES

- 1 Infrared Thermal Imaging
- 2 Acoustic Partial Discharge
- **3** Partial Discharge Mapping
- 4 TEV/EMF Partial Discharge
- 5 Electrical Signature Analysis (E.S.A)
- 6 UHF Partial Discharge Detection
- 7 Power Quality
- 8 Vibration Motor Analysis



TWINOAKS SDN BHD (591486-U)

No. 111-1, Jalan PUJ 3/3, Taman Puncak Jalil, Bandar Putra Permai, 43300 Seri Kembangan, Selangor Darul Ehsan Tel: +603-8074 8417 | Fax: +603-80748413 | Email: customerservice@twinoaks.com.my | Website: twinoaks.com.my Enquiries: +6012-3289865 (Norazlin) / +6019-2722300 (Hj Kamaruddin)



Panel Mounted Thermal Imager

IR Windov

DEG1



highlighted by the British Council (2017): Sense-making, social intelligence, novel & adaptive thinking and cross-cultural competency, etc.

CHALLENGES FACING ENGINEERING EDUCATORS

As we move to develop the engineering workforce of the future, Prof. Chuah reminded us of two issues: The perceived weaknesses and issues facing STEM educators. First, many students viewed STEM as "tough, boring, too technical and hence little fun". Second, STEM educationists have to grapple with a different set of problems such as employability of graduates, equity and access, innovation, financing, quality assurance and governance of education and TVET in the new era.

CONCLUSION

This short report answered the two above-mentioned questions. To recap, first, what are the challenges facing the engineering workforce in the digital era? Second, what are the issues facing engineering educators?

To the first question, armed with the requisite skills, the trained engineering workforce should be able to face challenges in the fields of inequality, pollution, food shortages, energy consumption, global warming and climate change, health & ageing and security (both physical and cyber space). To the second question, to survive the onslaught of a rapidly changing technological era, the answer could be in adopting a flexible attitude while being willing to embrace a life-long learning philosophy.

Before ending his lecture, Prof. Chuah asked what stakeholders can collectively do to strengthen the engineering workforce in order to reverse the trend of declining enrolment. He identified five focus areas:

- Accreditation of programmes offered by IHL should remain a top priority since the standard would be maintained in the process.
- Educators must be able to share their knowledge in the internet era "where complex cross-regional problems" are solved.
- Networking of like-minded professionals can further bring about a higher level of success.
- Our school system should be the budding bed that promotes interest in STEM.
- Engineering stalwarts should consider playing a more effective leadership role that facilitates the students' interest in this field.

Perhaps Winston Churchill's quote can motivate us further: "A pessimist sees the difficulty in every opportunity; an optimist sees the opportunity in every difficulty".

REFERENCES

- Mockler, R. (1968), The system approach to business organisation and decision making, California Management Review, 11, no. 2, 53-58. http://cmr.berkeley.edu/search/articleDetail. aspx?article=4166, accessed on 30 March 2019.
- [2] Ostrom, E. (1990), Governing the commons: The evolution of institutions for collective action, Cambridge University Press, http://wtf.tw/ref/ostrom_1990.pdf, accessed on 30 March 2019.
- [3] Robbins, S. S and Coulter, M. (2012), Management, 11th Edition, Pearson, p. 6.

Authors' Biodata

Ir. Dr Ooi Teik Aun Hon. FiEM, FICE graduated with BE and ME from Auckland University and PhD from Sheffield University. He was Superintendent of Research and Laboratory while in JKR. He is founder Chairman of TUSTD, Organising Chairman WTC2020, Deputy Chairman TUSTD, Director of TAO Consult, Director of IEMTC and IEM Academy.

Ir. Dr Wang Hong Kok is the Principal Lecturer of Tunku Abdul Rahman University College since 2014. He is an IEM Council Member, Honorary Treasurer (2016-2018), Founding Chairman of Urban Engineering Development Special Interest Group (UEDSIG), Founding Chairman of Tan Sri Yusuff Final Year Project Competition Committee. He is also a member of IEM JURUTERA Editorial Board.



27C, Medan Angsana, Bandar Baru Air Itam, 11500 Pulau Pinang Tel: (604) 826 5071 Fax: (604) 826 5860 H/P: 012 373 1705

www.nehemiahwalls.com

SPXFLOW >Lightnin

Compact Series Mixer - Affordable High Performance Mixing

Features:

- True Dry Well casted integrally into gearbox
- 0.75kW to 55kW
- OSHA, CE, ATEX and global Efficiency standards





by Gardner Denver



Model : NASH 2AV2 110 ~ 161

Gardner Denver NASH Liquid Ring Vacuum Pump

Features:

- Capacity up to 600m3/hr (360 CFM) special range for palm oil industry application.
- Vacuum Level up to 33 mbarA
- Material of construction available in SS316, SS304, Bronze and Cast Iron.
- Come with reinforced stainless steel shaft and sealed bearing
- Can provide 20,000 hours of maintenance-free operation
- Pedestal design, accepts most C-Faced motors

CEREX Metering Pump Type P

Features:

- API 675 compliance
- Hydraulic actuated double PTFE diaphragm
- Diaphragm condition monitoring with pressure gauge
- Double ball check valves
- NPT or Flange connections
- · Liquid-wetted metallic material SS316 or higher
- Manual linear stroke adjustment from 0 to 100%
- Motor suiting safe area or hazardous area
- Standard paint system

Applications:

- Palm Oil Refinery and Oleochemicals
- Boiler feed water treatment
- Oil & Gas additives dosing
- Industrial water and waste water treatment

Arachem (M) Sdn Bhd (127181-D)

Chemicals dosing

11. Persiaran Industri, Taman Perindustrian Sri Damansara, Bandar Sri Damansara, 52200 Kuala Lumpur, Malaysia. Tel: 603-6276 2323 Fax: 603-6273 3555 E-mail: marketing@arachem.com.my Website: www.arachem.com.my

SPXFLOW Bran+Luebbe



Designed for high pressure applications up to 103 Bar





ENGINEER'S LENS

SUSTAINABILITY ENGINEERING IN PARADISE

SETTERTIN

his is the scene one wakes up to after an afternoon nap on Phi Phi Island, Thailand. The crystal clear waters allow the reflection of the boat to be seen on the seafloor. Naturally so beautiful. But the engineer's eyes are drawn to the solar panel on the roof of the boat, installed to provide power when the engine is switched off. Though I do not know what kind of solar panel this is, there are a number of technologies associated with solar panels: Amorphous, monocrystalline, polycrystalline and semi-flexible monocrystalline. Each comes with different costs, wattages and efficiencies. (https://www.pbo. co.uk/expert-advice/solar-panels-everything-you-need-toknow-24455).

a**a**nei

Roof of the Boat

SAFE TEA TIME



The Next Reliable Choice





E : alphamail@alphasel.com W : www.chintmalaysia.com T : 603 - 5569 3698 F : 603 - 5569 4099

32

SOLUTION IN A CHECKLIST!



by Ir. Shum Keng Yan

Ir. Shum Keng Yan is a chemical engineer and a certified accident prevention and safety practitioner.

n the previous article, we looked at starting a Behavioural Observation process with the use of a Behavioural Observation card which will essentially have elements to observe and tick off. We all use checklists, either a physical checklist or a mental checklist.

Checklists are great! It helps me remember my routines. Routines enable me to be consistent all the time, without missing a beat! This wonderful invention is used everywhere, from airlines to hospitals and the production shop floor to my personal self so that I will not forget something.

What really is a checklist? How does a checklist function? In its most basic form, a checklist serves the following functions:

- 1. A broken down step-by-step standard process to be followed.
- 2. A quick aide-memoire on all the major items that we should not forget.
- 3. A control check that the process is followed and counter-signed.
- 4. A record that a certain sequence has been completed.
- 5. A documentation created as a governance.

Whatever the intention, we cannot escape from a checklist. This has its uses and its drawbacks. Here are some factors to consider:

- 1. Enlist users to sit together and come up with a checklist for their own place. This drives ownership and is more realistic.
- 2. Think through if the checklist can really add more value or marginal improvement based on the risk at hand.
- 3. Find alternatives to checklists, such as designed in behavioural nudges and Poka Yoke. These will reduce the number of checks as they are visual and suggestive.
- 4. Focus on the intention of the checklist in the first place. Does it drive results or is it another administrative layer?

Let us look from the context of Behavioural Safety Observation. Again, my emphasis is that in the initial stages, keeping a record, perhaps through Behavioural Observation Cards, will enable the proper observation process to be carried out. A well-designed card is actually a breakdown of the sequence of the observation process, the items to look out for and the learnings. It closes with an acknowledgement by both the observer and observee of the learnings and the recognition to each other for the willingness to make the workplace safer. The learnings are then replicated to other similar areas.

That sounds about right except that, in the workplace, it is common that this degenerates into a tick-the-box mentality. How often have you seen a matured Behavioural Observation programme turn into a "meet the number of cards per month" target? In fact, cards almost always seem to come in at the last week of the month to meet the target!

Here is a thought: Perhaps as the Behavioural Observation process matures, so should the learning process. We can start with observation cards. How will it look as we mature?. If you have done it, just tick it off and send your checklist to me at: **pub@iem.org.my**.

"Don't be afraid to have a reality check. Taking risks is OK, but you must be realistic." Joy Mangano



INWES-APNN 2018 CONFERENCE

WOMEN ENGINEERS SECTION







Group photo session

he 8th annual meeting of the International Network of Women Engineers and Scientists-Asia and Pacific Nation Network (INWES-APNN) was held on October 18 - 20 at The Centre for Women & Development (CWD) in Hanoi, Vietnam.

Established in 2011, INWES is a global network of organisations for women in Science, Technology, Engineering and Mathematics (STEM) and a UNESCO partner. The event, jointly organised by the Vietnam Women's Union and the Vietnam Association for Intellectual Women (VAFIW), gathered Vietnamese women and women delegates from other countries in the Asian-Pacific region.

Ir. Mah Siew Kien, Chairman of Women Engineers Section, IEM, presented Malaysia's country report which outlined activities conducted throughout the year, from STEM initiatives targeted at school children to women in leadership. Dr Marcella Lucas, CEO of LeadWomen (based in Malaysia) shared The Malaysian Journey of Women on Boards, in her presentation as an invited speaker. In Malaysia, women hold 15% of board seats on a total of 924 public-listed companies as at Q2, 2018.

A meeting was held among representatives of INWES-APNN countries to discuss current issues and the way forward. It was announced that Mongolia had won the bid to be the 4th Chair of INWES-APNN, from 2020 to 2023.

In the afternoon, delegates visited the Women Museum and Painting Exhibition which highlighted the role Vietnamese women played in their country's history





Delegates at the Conference

and would continue to play. The first day ended with a gala dinner where members of APNN countries gave spectacular performances.

On the second day, delegates were treated to three parallel panels focusing on three themes: Gender & Gender Equality in Science and Technology, Nutrition & Food Safety and Disaster Risk Management & Climate Change Adaptation. Ir. Prof. Dr Leong Wai Yie, from Malaysia co-chaired the gender equality track with Prof. Dr Nyugen Thi Doan, the Honorable President of VAFIW and former Vice-President of The Socialist Republic of Vietnam.

Delegates on the gender equality track were told that most countries had not achieved gender equality in science, technology, engineering and mathematics. Globally, women accounted for less than 30% of total science researchers but this number does not match women's potential in science and technology. In Asia, only 15% of science researchers are female. India has the lowest ratio, with only 10%, while The Philippines and Myanmar have high percentages of 55% and 85% respectively. According to Nguyễn Thị Bích Loan, Vice Rector of Commerce University, Vietnamese women had strengthened their position in society. The percentage of women acting as National Assembly deputies was 26.72 per cent, which was higher than the global average of 22.3 per cent. Favourable

conditions that removed barriers to allow women to reach their full potential should be put in place.

The delegates agreed that there should be more opportunities to share experiences on gender equality, especially in science and technology and emphasised the need to understand the challenges in increasing gender equity in the field.

Other workshops held addressed disaster risk management, climate change adaptation and food safety. Climate change affected every aspect of life, including the environment, security, food safety, the economy and culture. The delegates reiterated the responsibilities of individuals and businesses in playing a critical role in reducing the impact of climate change.

A Hanoi Declaration adopted on 19 October, outlined the commitment of APNN members towards strengthening cooperation

and coordination between female scientists and engineers in the region to support the growth of the region and as a commitment to United Nations' sustainable development goals (SDGs). The declaration acknowledged the importance of female scientists in sustainable growth and the development of economies during the 4th Industrial Revolution, as well as the necessity to narrow the gender gap in science and technology.

On the last day, a technical visit to Trang An, a UNESCO world heritage site located south of Hanoi, had been arranged for the delegates. However, sometimes even the

> best laid plan has to be changed. Due to unexpected bad weather, the delegates were brought instead to the Bai Dinh Pagoda in Ba Rau hills, near the Hoang Long River. This is Southeast Asia's largest Buddhist complex, comprising several temples and over 500 intricately carved statues of Buddha, At Ninh Binh Province, the delegates were treated to luncheon hosted by the Chairman of the People's Committee of Ninh Binh Province.

> The INWES-APNN delegates showed their strong commitment and concerted efforts towards making the INWES-APNN conference a unique event. They are now looking forward to the INWES-APNN 2019 meeting in Nepal next year. INWES-APNN countries are dedicated to implementing activities focused on supporting the strategic objective of gender equality.



Dr Marcella Lucas (LeadWomen & 30% Club Malaysia Chapter), Ir. Mah (IEM) and Ir. Prof. Dr Leong (IEM) of Malaysia



TECHNICAL VISIT TO KVMRT LINE 2 – V207 MINED TUNNEL SITE

WOMEN ENGINEERS SECTION

reported by





View of the V207 tunnel site in Taman Universiti

he Tunnelling & Underground Space Technical Division of IEM organised a site visit to KVMRT Line 2 – V207 Mined Tunnel on 11 August, 2018. Apart from 26 IEM members, the visit also attracted 24 participants from PT. Geotechnical Engineering Consultant in Kota Bandung, Indonesia. The visit provided a platform for interaction and the exchange of ideas as well as fostered good relationship between the two groups.

Leaving Bangunan Ingenieur in Petaling Jaya at 9:00 a.m., the delegation reached the MRT Sri Kembangan Information Centre at 9:30 a.m. where Mr. Vincent Neng, V207 Project Manager, gave a briefing of the project. He said that due to the short tunnel length of just 182m, the V207 was a mined tunnel measuring 12.1m wide and 10.1m high and it cut across a hilly area.

The tunnel system was proposed to accommodate a twin-track railway line crossing mountainous terrain comprising the Kenny Hill Formation of interbedded weak rocks and residual soils. Mr. Neng briefed the group on the various construction stages using New Austrian Tunnelling Method (NATM).

The NATM integrates the principles in the behaviour of rock masses under loading condition and monitors the behaviour of underground work during construction. The NATM is not a set of specific excavation and support techniques; it is often referred to as a "design as you go" approach, which makes the mined tunnel interesting and challenging.



Project briefing by Mr. Vincent Neng









Tunnel support system: (a) Steel ribs and (b) Forepoles

The sequence of tunnel excavation for V207 is shown in the diagram here. Forepole and friction bolts are selected to support the arch of the top heading around the tunnel crown as well as tunnel walls. This is coupled with steel ribs plus steel fibre reinforced (SFR) shotcrete as temporary supports for primary permanent cast in-situ concrete lining during the mined tunnelling works.

After the briefing, the participants proceeded to the V207 tunnel site in Taman Universiti where they had a close view of the actual tunnel portal construction. A representative of OTA Tunnel Squad Sdn. Bhd. gave a briefing on both the geological mapping work and excavation of the mined tunnel in geater detail. The visit ended at noon after a group photo session in front of the tunnel portal.



Group photo in front of the V207 tunnel worksite

ENGINEER'S ADVENTURES

GREEN, GREEN ICELAND



Ir. Chin Mee Poon

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.



Green, Green Iceland

ften dubbed "Land of Fire and Ice", Iceland can hardly be described as green since verdant jungles are almost completely absent in its landscape. But this island, situated just south of the Arctic Circle with a land mass (103,000 sq. km.), a little short of ½ that of our country, but a population (326,000) that's only about 1% of ours, stands out as a world leader in the use of renewable energy. In fact, almost 100% of the electricity needed is generated from renewable sources, including hydropower, geothermal power and wind power. In this respect, Iceland is very, very green indeed.

With extraordinarily extensive geothermal activities throughout the island, it is easy to understand why geothermal energy accounts for about 65% of the total primary energy utilised in Iceland, but the bulk of this energy, in the form of hot water, is used to heat up almost 90% of all the buildings in the country as well as swimming pools, fish farms and greenhouses, via networks of insulated pipes between the sources and the urban areas.

As a result, only about 27% of the electricity produced comes from geothermal energy; the rest comes from hydropower, with wind power playing a relatively insignificant role. Fossil fuel, mainly used in the transportation industry, accounts for only about 15% of all primary energy used.

During a 38-day exploration of this island state undertaken by my wife and I, together with my younger brother and his wife, in a rented vehicle in the middle of last year, we came across many outdoor hot spring pools that are free for use by just anybody. Some of the pools are right in the centre of towns and villages. Those away from urban centres are also conveniently located near roads and all are equipped with changing rooms and bathrooms. We had a great time in the free spas.

We also came across several geothermal power stations and hydropower stations. In North Iceland, after spending much time at the otherworldly Mývatn Lake, we went in a north-east direction and passed right through Krafla Geothermal Power Station. Looking back from an elevated vantage point, all that we saw of the power station were pipelines running in all directions between some buildings of different shapes and sizes on both sides of the road.

With a rated output of only 60 MW, Krafla is the second smallest of Iceland's 5 geothermal power stations. Construction work started in 1974 but the station was only completed in 1977 because of intervening seismic and volcanic activities at the site.

Like coal-fired and fuel oil-fired thermal plants, geothermal plants also use steam turbines coupled with generators to produce electricity. Depending on how the heat in the geothermal reservoir is harnessed to produce steam to turn the turbines, these plants can be divided into 3 main types: Dry steam, flash steam and binary cycle.

Iceland's pristine nature and clean environment are due mainly to its small population, lack of heavy industries and high use of geothermal and hydroelectric power.

Its abundant supply of renewable primary energy and relative low cost of electricity production, however, have attracted some energy intensive industries from overseas. Alcoa, an American aluminium-smelting company, for example, built a large factory near the fjord-side town of Reyðarfjörður. To meet its energy requirements, the Kárahnjúkar hydroelectric station was constructed 80km away in east Iceland in 2009, involving a network of dams and tunnels, a vast reservoir, a power station and kilometres of power lines. This caused substantial damage to the landscape and environment, although it also created some jobs for the local people.

The Icelanders have to strike a delicate balance between their desire to reap maximum benefits from the natural bounties available and the need to preserve the fragile nature of the land.

NEWS FROM BRANCH

CHINESE NEW YEAR OPEN HOUSE AT IEMNS

NEGERI SEMBILAN BRANCH



Ir. Dr Oh Seong Por

n 15 February, 2019, The Institution of Engineers, Malaysia Negeri Sembilan Branch (IEMNS) celebrated Chinese New Year with an Open House in the seminar hall at the IEMNS office in Oakland Commercial Square, Seremban.

Originally scheduled from 11.00 a.m. to 2.00 p.m., it was extended till 4.00 p.m. due to special request. Even before 11a.m., auests had started to arrive.

IEMNS members who attended included two Past Chairman, Ir. Tiong Ngo Pu (2001/2003) and Dato' Ir. Mohammad Noor bin Abu Hassan (2011/2013), as well as present and past committee members, Ir. Richard Khoo and Ir. Badiuzzaman Harun.

Ir. Mah Siew Kien, Chairman of IEM Women Section, mingled warmly with IEMNS members. Despite their busy working schedules, numerous consulting engineers took the effort to attend the special occasion.

Invitations were also extended to members from industries which had actively supported IEMNS, such as Kibing Group, Samsung SDI Energy Malaysia Sdn. Bhd. and Kualiti Alam Sdn. Bhd. These were represented by engineers and managers including Encik Faizul, Mr. Maharam and Ir. Hazlin.

Also present were the chairman of the Technical Association of Malaysia, Negeri Sembilan Branch (TAMNS) cum Honorary Treasurer of IEMNS, Ir. Chong Chee Yen, and Ms. Jenny Wang, chairman of the Real Estate & Housing Developers' Association, Negeri Sembilan Branch, who shared ideas on current housing matters in the state.

The speaker for the CIPAA Act 2012, lawyer Yang Tek Yeh, arrived in the afternoon together with Ir. Tiong. His talent for story-telling and his great sense of humor kept listeners entertained.

While enjoying local cuisine, Mandarin oranges and CNY cookies, participants were briefed on the activities of IEMNS 2018/2019 which included technical visits to successful organisations, special focused seminars, road shows on how to become a professional engineer and mutual collaborations with universities as well as industry partnerships. The activities were geared towards enhancing the



IEMNS Chinese New Year Open House



Dining and networking

NEWS FROM BRANCH



IEM, REHDA and local industry members

competency of member and advancing engineering profession. During the briefing, photo slides were shown to the guests.

Besides celebrating CNY, the event also created opportunities for members and partners to meet, strengthen friendships and network. ■

	May-JUNE 2019
I-Day Course on "Urban Drainage Modelling for Design" Date : 23 May 2019 (Thursday) Time : 9.00 a.m. to 5.30 p.m. Venue : Wisma IEM Approved CPD : 7.0 Speaker : Dr. James Lau	I-Day Short Course on "Practical Application of FEM in Geotechnical Engineering"Date:14 June 2019 (Friday)Time:8.30 a.m. to 6.00 p.m.Venue:Hilton Hotel, Petaling JayaApproved CPD:7.5Speaker:Prof. (Engr. Dr.) Harry Tan Siew Ann
Awareness Talk & Pl Workshop on Enhanced Pl Process Date 25 May 2019 (Saturday) Time 9.00 a.m. to 1.00 p.m. Venue Wisma IEM Approved CPD 3.0 Speaker Ir. Chen Harn Shean	2-Day Course on "Contract Management Hiccups"Date:17 - 18 June 2019 (Monday - Tuesday)Time:9.00 a.m. to 5.30 p.m.Venue:Wisma IEMApproved CPD:14.0Speaker:Ir. Lai Sze Ching
2-day Course on "Malaysian Civil Engineering Standard Method of Measurement (MyCESMM2)"	ERRATA
Date: 11-12 June 2019 (Tuesday - Wednesday)Time: 8.30 a.m. to 5.30 p.m.Venue: Wisma IEMApproved CPD: 13.5Speaker: Ir. Hj. Shahul Ikram bin Hj. Adnan, Ir. Ho Kin Wing & Ir. Gunasagaran Kristnan	Error on "60TH ANNIVERSARY MESSAGE" published in JURUTERA April 2019 issue – in Page 19. Ir. Dr Ting Wen Hui IEM PRESIDENT 1995 - 1997 The error is much regretted.

Thank You for Your Support From Dimension Publishing Sdn. Bhd.



ADC Power Concept Sdn. Bhd.



API Precast Marketing Sdn. Bhd.



Datmel Technology Sdn. Bhd.



Alpha Automation (Sel) Sdn. Bhd.



Crib Technologies Sdn. Bhd.



Eastern Pretech (M) Sdn. Bhd.



Eco World Development Group Berhad



Eureka Engineering Enterprise Sdn. Bhd.







HCR Bridge Machinery (M) Sdn. Bhd.



Hikvision Malaysia Sdn. Bhd.

Thank You for Your Support From Dimension Publishing Sdn. Bhd.



Huls Group of Companies



Maccaferri (Malaysia) Sdn. Bhd.



RNC Integral Technology (M) Sdn. Bhd.



Simhan (M) Sdn. Bhd.



TenCate Geosynthetics Asia Sdn. Bhd.





MicroEngine Technology Sdn. Bhd.



Selesa Technology Sdn. Bhd.



SIRIM QAS International Sdn. Bhd.



WEG South East Asia Sdn. Bhd.

EMUDUGA PROFESSIONAL

No KE 208 183 159

495

Kepada Semua Ahli,

Tarikh: 8 April 2019

SENARAI CALON-CALON YANG LAYAK **TEMUDUGA** MENDUDUKI PROFESIONAL **TAHUN 2019**

Berikut adalah senarai calon yang layak untuk menduduki Temuduga Profesional bagi tahun 2019.

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 2019.

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.

Ir. Mohd Khir bin Muhammad FIEM, PEng

Setiausaha Kehormat, IEM (Sessi 2018/2019)

PERMOHONAN BARU			
Nama	Kelayakan		
KEJURUTERAAN SIVIL			
GUYARN PANGGAU WATT PANGAU	ADV. DIP (UITM) (CIVIL, 1995)		
NORJULIZA AZLINA BINTI MOHD BASRI	BE HONS (UITM) (CIVIL, 2008)		
ZURIANI BINTI HAMZAH	BE HONS (UTM) (CIVIL, 2005)		
KEJURUTERAAN ELEKTRONIK			
AHMAD AZLAN BIN AB AZIZ	BE HONS (UTHM) (ELECTRICAL, 2008) MSc (UITM) (TELECOMMUNICATION & INFORMATION, 2012)		

PERMOHONAN BARU / PERPINDAHAN MENJADI AHLI KORPORAT

Nama Kelayakan **KEJURUTERAAN ELEKTRIKAL** MOHD NASSURUDDEN BIN KADER BAWA BE HONS (UTM) (ELECTRICAL, 2007)

PERPINDAHAN AHLI				
No. Ahli	Nama	Kelayakan		
KEJURUTERAAN AWAM				
54245	AHMAD AZIMI BIN KAMALUDDIN	BE HONS (UTP) (CIVIL, 2009) MSc (DELFT UNIVERSITY OF TECHNOLOGY) (CIVIL, 2017)		
37207	AMILIAH BINTI CHIKON	BE HONS (UiTM) (CIVIL, 2002)		
86180	AZLIZA @ MOHD ANUAR BIN ABD GHANI	BE HONS (UTM) (CIVIL, 2006)		

43545	CHAN HWA FANG	ME (PORTSMOUTH) (CIVIL, 2003)			
103108	CHONG CHAN KIAT	BE HONS (SEGI UNIVERSITY) (CIVIL, 2013)			
60646	EE PEI LIAN	BE HONS (SWINBURNE) (CIVIL, 2010)			
87384	GOH KOK KEONG	BE HONS (MALAYA) (ENVIRONMENTAL, 2015)			
64802	HO KENG SING, KENNETH	BE HONS (KLIUC) (CIVIL, 2011)			
70261	LING JEN HUA	BE HONS (UTM) (CIVIL, 2006)			
		ME (UTM) (CIVIL - STRUCTURE, 2008)			
		PhD (UTM) (CIVIL, 2011)			
33245	MOHD FIRDAUS FAEZAL BIN	BE HONS (UITM) (CIVIL, 2008)			
	CHE AZMI	MSc (UITM) (CONSTRUCTION, 2018)			
29795	SURIYADI BIN SOJIPTO	BE HONS (UTM) (CIVIL, 2004)			
99170	TAN TENG HAU	BE HONS (MALAYA) (CIVIL, 2012)			
26423	VIKNESWARAN A/L MUNIKANAN	BE (HONS) (UTM) (CIVIL - ENVIRONMENTAL,2000)			
		ME (UTM) (ENVIRONMENTAL MANAGEMENT,			
05050					
85950	YEO PONG WEE	MANAGEMENT 2009) ME STRUCTURES			
		(MELBOURNE) (2010)			
KEJURU	TERAAN ELEKTRIKAL				
93552	KUAN LUK CHEONG, RANDY	BE HONS (ROYAL MELBOURNE) (ELECTRICAL,			
		2013)			
25071	MARAYATI BTE MARSADEK	BE HONS (UNITEN) (ELECTRICAL POWER, 2012)			
		ME (UNITEN) (ELECTRICAL, 2006) PhD (UKM)			
		(ELECTRICAL, ELECTRONIC & SYSTEM, 2011)			
KEJURU'	TERAAN ELEKTRONIK				
74391	LIM BOON HAN	BE HONS (UTM) (ELECTRICAL, 1998) BED (UTM) (2003)			
38611					
30011	LIEW WENG HOI	MSc (UKM) (CHEMICAL & PROCESS 2013)			
		PhD (UTM) (CHEMICAL, 2016)			
61153	ROSIAH BINTI ROHANI	BE HONS (UTM) (CHEMICAL, 2003)			
		ME (UTM) (CHEMICAL, 2007)			
KEJURU	TERAAN MEKANIKAL				
50129	MAHATHIR BIN RAHMAN	BE HONS (UITM) (MECHANICAL, 2011)			
70568	TAN CHEE HSIANG	BE HONS (UTAR) (MECHANICAL, 2014)			
KEJURU	TERAAN PEMBUATAN				
66719	JOSHUA A/L JAYA PRAKASH	BE HONS (USM) (MAUFACTURING			
		ENGINEERING WITH MANAGEMENT, 2010)			
		PhD (USM) (2014)			
PERMOHONAN BARU / PERPINDAHAN					
MENJADI AHLI KORPORAT					
No. Ahli	Nama	Kelayakan			
KEJURU	TERAAN MEKANIKAL				

59	ASRAWADI BIN MUSTAFA	BE HONS (MALAYA) (CIVIL, 1994)
97	LEE WEI KOON	BE HONS (UTM) (CIVIL, 1999) ME (NANYANG) (CIVIL, 2002) PhD (OXFORD) (2015)
25	MOHAMAD ZOLIHAN BIN NGADENI@ABD WAHAB	BE HONS (MALAYA) (CIVIL, 1995)
80	UDA BIN SARIMIN	BE HONS (UTM) (ELECTRICAL-MECHATRONICS, 2002)





Halfday Course on "Introduction to Marine Engineering"

....

Date	:	19 June 2019 (Wednesday)
Time	:	8.30 a.m. – 1.00 p.m.
Venue	:	Motor Yacht Puteri Samudra at Royal Selangor Yacht Club, Port Klang Selangor
Approved CPD	:	Applying
Speaker	:	Ir. Roznan bin Abdul Rashid

1-Day Course on **"Technical Report Writing**

Date	:	20 June 2019 (Thursday)
Time	:	9.00 a.m. – 5.30 p.m.
Venue	:	Wisma IEM
Approved CPD	:	Applying
Speaker	:	First Admiral Dato' Ir. Hj. Ahmad Murad bin Hj. Omar (Rtd) and Ir. Dr. Ching Yern Chee

1-Day Course on "Sustainable **Development Goals (SDG6)** - Clean Water and Sanitation What Can We Do! "

Date	:	25 June 2019 (Tuesday)
Time	:	9.00 a.m 5.30 p.m.
Venue	:	Wisma IEM
Approved CPD	:	Applying
Speaker	:	lr. Gary Lim, Ms. Rachel Koh & TPr. Lee Lih Shyan



CONTINUATION LIST FROM APRIL JURUTERA 2019 ISSUE

PERMOHONAN MENJADI AHLI SISWAZAH

No. Nama Kelayakan

Ahli				
KEJUF	UTERAAN MEKA	RONIK		
101039	KONG KAH FAI	B.E.HONS.(THE UNI. OF SYDNEY)(MECHATRONIC, 2013)		
101024	AZRUL BIN AHMAD	B.E.HONS.(UniMAP) (MECHATRONIC, 2012)		
100924	HOONG YONG SHENG, VINCENT	B.E.HONS.(UTAR SG LONG) (MECHATRONICS, 2018)		
100920	LEE YING HUA	B.E.HONS.(UTAR SG LONG) (MECHATRONICS, 2018)		
100919	LEONG CHEW FAI	B.E.HONS.(UTAR SG LONG) (MECHATRONICS, 2018)		

KEJURUTERAAN PEMBUATAN

100693	MUHAMAD FAQIHIDDIN SYAH BIN MUHAMAD KHALIL	B.E.HONS.(UMP) (MANUFACTURING, 2016)
100898	DR GOH CHING PANG	B.E.HONS.(USM) (MANUFACTURING ENGINEERING WITH MANAGEMENT, 2013) PhD. (USM)(VISION SYSTEMS, 2017)
101046	LAU SIE YEE	B.E.HONS.(UTeM) (MANUFACTURING- ENGINEERING MATERIALS, 2009) MEM.(UPM) (ENGINEERING, 2011)
100847	MUHAMMAD FAROUQ BIN MUHAMMAD FAISAL	B.E.HONS.(UTeM) (MANUFACTURING- MANUFACTURING PROCESSES 2008)

KEJURUTERAAN PETROLEUM

101048 MOHD NIDZAM BIN B.E.HONS.(UiTM)(OIL & GAS, CHE AZIZ 2017)

PERMOHONAN MENJADI AHLI 'INCORPORATED'

No. Ahli	Nama	Kelayakan		
KEJUF	RUTERAAN AWAM			
100661	DR CHOUDHARI JAYSING BABURAO	B.E.(SHIVAJI UNIVERSITY KOLHAPUR)(CIVIL, 2000) M.Tech,(INDIAN INST. OF TECHNOLOGY ROORKEE) (CIVIL, 2003) PhD.(INDIAN INST. OF TECHNOLOGY ROORKEE)(CIVIL, 2008)		
100801	A. SIVARAM A/L N. ARUMUGAM	B.E.HONS.(SHEFFIELD HALLAM UNI.)(CIVIL, 1998)		
100865	ARIC CHYE CHANG SHENG	B.E.HONS.(UNI. OF SURREY) (CIVIL, 2017)		
KEJUF	RUTERAAN ELEKT	RIKAL		
100800	MOHD SYAFIQ BIN SHAWALUDIN	B.E.HONS.(UNI. OF SUNDERLAND)(ELECTRONIC & ELECTRICAL, 2013)		
100866	FARHAN BIN ABDULLAH	B.E.TECH.HONS.(UNIKL) (ELECTRICAL, 2014)		
KEJUF	RUTERAAN ELEKT	RONIK		
33961	NG KEAT SIONG	B.E.Tech.(UNI. OF SOUTHERN QUEENSLAND)(ELECTRICAL & ELECTRONIC, 2004)		
KEJUF	RUTERAAN KIMIA			
100863	KHAW HERN SHEAN	B.E.HONS.(THE UNI. OF NOTTINGHAM)(CHEMICAL with ENVIRONMENTAL, 2008)		
KEJUF		NIKAL		
100802	LOW VOON FUI	B.E.HONS.(SHEFFIELD HALLAM UNI.)(MECHANICAL & MANUFACTURING SYSTEMS, 2006)		
KEJURUTERAAN MEKATRONIK				
100864	AHMAD ADNAN BIN MUSTAFA	B.E.TECH.HONS.(UNIKL) (MECHATRONICS, 2010)		
PERMOHONAN MENJADI AHLI 'AFFILIATE'				
No. Ahli	Nama	Kelayakan		

KEJURUTERAAN TELEKOMUNIKASI 100709 YUSOFF BIN MAT B.Sc.(UKM)(PHYSICS, 1992)

PERMOHONAN MENJADI AHLI 'ASSOCIATE'

No.	Nama	Kelayakan
Ahli		

KEJURUTERAAN BAHAN 100850 DR CHOO HUI LENG DIP.T

HOO HUI LENG	DIP.TECH.(TAR
	COLLEGE)(MATERIALS &
	MANUFACTURING, 2003)
	ADV. DIP.TECH.(TAR
	COLLEGE)(MATERIALS &
	MANUFACTURING, 2005)
	M.Sc.(QUEEN'S UNI. OF
	BELFAST)(POLYMER, 2006)
	PhD.(QUEEN'S UNI. OF
	BELFAST)(2011)

KEJURUTERAAN BANGUNAN

100662 ROSHARIZAL BIN ROSLI Dipl.(UiTM)(BUILDING, 2005) B.ConstMgt.Hons.(UiTM) (CONSTRUCTION MANAGEMENT, 2007)

KEJURUTERAAN MEKANIKAL 100713 ZULKIFLI BIN DIP.(P AMRAN AUTO

DIP.(PSMZA)(MECHANICAL-AUTOMOTIVE, 2010) ADV DIP (SULTAN AZLAN SHAH POLYTECHNIC) (AUTOMOTIVE DESIGN & MANUFACTURING, 2012)

KEJURUTERAAN SISTEM KOMPUTER

100714 LEROY @ KULLEH HND.(SOUTHERN ANAK SININ QUEENSLAND)(COMPUTER SYSTEM.2007)

Note: Continuation of the Transfer Graduate, Graduate, Incorporated, Affiliate and Associate would be published in June 2019. For the list of approved "ADMISSION TO THE GRADE OF STUDENT", please refer to IEM web portal at http://www.myiem.org.my.

2-Days Course on "Optimising Compressed Air System Energy Efficiency"

Duic	·	(Wednesday-Thursday)
Time	:	9.00 a.m 5.30 p.m.
Venue	:	Wisma IEM
Approved CPD	:	Applying
Speaker	:	Ir. Luk Chau Beng and Mr. Kelvin Low

UPCOMING ANNUAL GENERAL MEETINGS -TECHNICAL DIVISION

DATE	TECHNICAL DIVISION	CPD	
18 May 2019	Environmental Engineering Technical Division (ENETD)	2	
25 May 2019	Marine Engineering and Naval Architecture Technical Division (MNATD)	2	
15 June 2019	Geotechnical Engineering Technical Division (GETD)	2	
22 June 2019	Water Resources Technical Division (WRTD)	2	
For further details on the various			

events, please visit our website at www.myiem.org.my or call IEM Secretariat at 03-79684001

Pengumuman yang ke-127

SENARAI PENDERMA KEPADA WISMA DANA BANGUNAN IEM

Institusi mengucapkan terima kasih kepada semua yang telah memberikan sumbangan kepada tabung Bangunan Wisma IEM. Ahli-ahli IEM dan pembaca yang ingin memberikan sumbangan boleh berbuat demikian dengan memuat turun borang di laman web IEM http://www.iem. org.my atau menghubungi secretariat di +603-7968 4001/5518 untuk maklumat lanjut. Senarai penyumbang untuk bulan Mac 2019 adalah seperti jadual di bawah:

NO.	NO. AHLI	NAMA	
1	89985	MR. MUHAMMAD FARUQI BIN RAHMAD	
2	19936	MR. MARCELLINUS LEO BIN P. LINUS	
3	97287	MR. DAVE SINTI	
4	29023	MR. IMRAN AZIM BIN AZHARUDDIN	
5	06544	IR. WONG HAN PIU	
6	80581	IR. JUNA AZLEEN BIN ABDUL GHANI	
7	41039	MR. YAHAYA BIN RAMLI	
8	13872	IR. SOH ENG LU	
9	11912	DATO' IR. MOHD SALIM BIN ALI	
10	07504	IR. CHEO WEE WAH	
11	07160	MR. KOH JIT HUAT	
12	86006	MR. CHIN WEE YANG	
13	80788	MR. KHAILASH DHASAN A/L VELAUTHAM	
14	22936	IR. LIAW WEI LOONG	
15	34326	MR. GAN SIEW CHEOK	
16	24713	IR. SHIA SIN SAN	
17	15362	MR. YU KIANG HOCK	
18	09542	IR. WONG NENG KWONG, PETER	
19	21275	MR. YONG KOK HOONG	
20	07039	IR. WONG YII HENG	
21	13229	IR. MUHYI @ MOHAMAD YUSOF BIN HAJI ALI	
22	13440	IR. ALI R. EBADI	
23	11462	IR. LIU PNG HOCK	
24	86607	EN. ABDUL YASIM BIN ALI	
25	08592	IR. RAYMOND CHIEW HUEY SHENG	
26	04396	IR. OOI SAN KOOI	
27	16288	IR. PUAN NOR'IN BT MAN	
28	30536	MR. MOHD DALIAS BIN AWI	
29	25252	MR. FOO YEW CHIN	
30	05930	IR. ANANTARAJU PILLAI	
31	26740	IR. MHD. SHUKREE BIN SHAHABUDIN	
32	25658	MR. LIEW VOON HING	
33	16994	IR H.I HASNI BIN HASSAN	



JURUTERA MELLEMENTERA

Circulation and Readership Profile

JURUTERA has an estimated readership of **198,000** professionals. Our esteemed readership consists of certified engineers, decision making corporate leaders, CEOs, government officials, project directors, entrepreneurs, project consultants, engineering consulting firms and companies involved with engineering products and services.

Advertising Benefits

Our business partners can be assured that their products and services will be given the circulation and exposure they deserve, thus maintaining a sustained advertising presence to our core readers of decision-making engineers and technical experts. Our website offers an even wider market reach, with added international presence, aided by our international affiliation with official engineering bodies all over the world. Our online and offline advertising features such as banner advertising, article sponsorship and direct e-mail announcements have proven to be successful marketing strategies that will set the businesses of our partners apart from their competition.









HALL 11/1/ 1510	PRICES PER INSERTION IN RINGGIT MALATSIA (RM)				
SPECIFIED POSITION (Full Colour Ad)	1 INSERTION	3 INSERTIONS	6 INSERTIONS	9 INSERTIONS	12 INSERTIONS
Outside Back Cover (OBC)	7,800	7,050	6,750	6,450	6,150
Inside Front Cover (IFC)	7,250	6,650	6,350	6,050	5,750
Inside Back Cover (IBC)	6,750	6,250	5,950	5,650	5,350
Page 1	6,650	6,150	5,850	5,550	5,250
Facing Inside Back Cover (FIBC)	6,150	5,850	5,550	5,250	4,950
Facing Cover Note (FCN)	5,850	5,300	5,100	4,900	4,700
Facing Contents Page (FCP)	5,700	5,150	4,950	4,750	4,550
Centre Spread	11,200	9,500	9,000	8,500	8,000
ROP Full Page	4,900	4,500	4,300	4,100	3,900
ROP Half Page	2,900	2,650	2,550	2,450	2,350
ROP 1/3 Column	2,200	2,000	1,900	1,850	1,800
ROP 1/4 Page	1,950	1,750	1,650	1,600	1,550

ADVERTISING RATES

Special Position: +15%

Overseas Advertiser: +25% (Full Advance Payment Required) All prices shown above exclude Computer to Plate (CTP) charges *Please note that the above prices will be subjected to SST *Advertising rates displayed do not include 15% advertising agency commission

For advertising enquiries, please contact:



dimensionpublishing The Choice of Professionals

Dimension Publishing Sdn. Bhd. (449732-T)

Level 18-01-02, PJX-HM Shah Tower, No. 16A, Persiaran Barat, 46050 Petaling Jaya, Selangor Darul Ehsan, Malaysia. Tel: +603 7493 1049 Fax: +603 7493 1047 E-mail: info@dimensionpublishing.com Joseph How : +6011 1234 8181 Shirley Tham : +6016 283 3013

Subscribe to IEM's Publications Now!

Yes! I would like to be a subscriber of The Institution of Engineers, Malaysia's publications

Nar	ne:				
Mai	ling Address:				
		Country:			
Cor	npany/Institution:				
Title	9:				
Tele	phone No: Fax:		Email:		
	New Subscriber Renewal				
Ple	ase commence my subscription from:	(m	onth/year) Signature:		
To : +60	start your subscription of IEM's publications, complete this form a 3 7493 1047. Thank you.	nd m	ail it back to the address be	elow. For faster processing, fax it to:	
Wh	at is your primary job title?	Wha	at are the main activities of	your organisation? (Tick all that apply)	
\square	Corporate Management (including chairman, president, proprietor,	Con	structions of:	Manufacturer of:	
	partner, director, vice president, general manager, division manager, import/avport manager other comported title)		Roads/bridges	Construction equipment	
	Management (including project/contract/equipment/service/transport		Dams/reservoirs/irrigation	Cement	
	district manager, clerk of works, other technical or operating manager)		Harbours/offshore structures	Other construction materials	
	Engineering/Design (including chief engineer, chief designer, civil/		Foundations/tunnels	Distribution	
	highway/mechanical/planning engineer, other engineering/design title)		Pipelines/refineries	Construction equipment	
	Buying/Purchasing (including chief buyer, buyer, purchasing officer, other buying/purchasing title)		Structures/steel work	Hire/rental of construction equipment	
\square	Titles allied to the field (architect, consultant, surveyor, research and		Housing		
	development professor, lecturer, supervisor, superintendent, inspector		Construction management	Earth-moving/open cast mining	
			Deep mining	Aggregate production	
		\square	Others (Please specify)		
Wh	at type of organisation do you work in? (Tick one box only)				
\square	Contractor	Rate	e (Please tick)		
	Sub-contractor specialist	RM360.00 - 12 issues of JURUTERA		ERA	
	Design and build contractor	RM84.00 - 2 issues IEM Journal (Half-yearly)		(Half-yearly)	
	Consulting engineering/architectural/guantity surveying practice	_			
\square	Mining/quarrying/aggregate production company	1 err	ns and Conditions: The subscription is to be prepaid.		
	Petroleum producer	 Please make cheque payable to Dimension Public Subscriptions are not refundable. Magazine/s will be sent to the mailing address give Students are entitled for a 20% discount from the a Students must submit a photocopy of the student ic 		Dimension Publishing Sdn. Bhd.	
	International/national authorities			ailing address given.	
	National/regional/local government			iscount from the above subscription rate.	
	Public utilities (electricity, gas, water, deck and harbour, other)	-)	· · · · · · · · · · · · · · · · · · ·		
	Manufacturer	 The above rate is inclusive of delivery charges and applicable in Malaysia only. 			
	Distributor/importer/agent	8)	Additional delivery charges will a	pply to overseas subscribers.	
	Construction department of large industrial/Commercial concern	For	subscription enquiries, please	contact +603-7493 1049 or email to	
	Association/education establishment/research	info	@dimensionpublishing.com.		
	Construction equipment hire/rental company				
	Project/construction management consultancy				
	Others (please specify)				



 dimensionpublishing
 DIMENSION PUBLISHING SDN. BHD. (449732-T)

 The Choice of Professionals
 Level 18-01-02, PJX-HM Shah Tower, No. 16A, Persiaran Barat, 46050 Petaling Jaya, Selangor Darul Ehsan, Malaysia

 Tel +603 7493 1049
 Fax +603 7493 1047
 Website www.dimensionpublishing.com



ANCHOR-REINFORCED EARTH

Our Strength is Your Confidence

APPLICATION • Bridge Abutment • Land Reclaimation • Housing Development & Temporary Embankment • Other Civil Engineering Application



CT CRIB[™] The Most Reliable & Cost Effective Retaining Wall System

APPLICATION • Slope Protection • Embankment Stabilization • Housing & Road Project • Other Civil Engineering Application



For enquiry please contact: **CRIB TECHNOLOGIES SDN BHD** (564096-A), **ARE WALL (M) SDN BHD** (542608-W) No. 28-2, Jalan Setia Utama AS U13/AS, Setia Alam, Sek U13, 40170 Shah Alam, Selangor Tel: +603-3359 1227 (Hunting Line) Fax: +603-3358 7392 Email: groadesb@yahoo.com Website: http://www.ctsbare.com