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To All Members, Date: 6 January 2006

CANDIDATES APPROVED TO SIT FOR YEAR 2006 PROFESSIONAL INTERVIEW

The following candidates have been approved to sit for the Professional Interview for 2006.

In accordance with Bylaws 3.7, the undermentioned names are published as having applied for membership of the Institution, subject to passing the year 2006 Professional Interview.

If any Corporate Member of the Institution has any reason as to why any of the candidates is not a fit and proper person for election, he should communicate in writing to the Hon. Secretary. Such communication should be lodged a month from the date of publication.

Ir. MC Hee
Honorary Secretary, IEM

TRANSFER APPLICANTS

Membership No	Name	Qualifications
	Chemical Engineering	
22672	LAW CHUNG LIM	BE (HONS) (UKM) (CHEM & PROCESS, 98) MSC (UKM) (CHEM & PROCESS, 2000)
	Civil Engineering	
17283	CHEK CHEOK FAI	BE (HONS) (UTM) (CIVIL, 2000)
22105	KHOO MONG WEI, EDWARD	BE (HONS) (UTM) (CIVIL, 2000)
21979	OLIVER AK JUNAIDI	BE (HONS) (BIRMINGHAM) (CIVIL, 2000)
	Electrical Engineering	
18372	CHEW KAR PING	BE (HONS) (UMIST &VICT. UNI. OF MANCHESTER) (ELECT & E'TRONIC, 95) MSC (NAT. UNI. OF S'PORE) (ELECT, 2001)
22922	GOHULAND MARKANDOO	BSC (WICHITA STATE) (ELECT, 98)
23913	LIEW YIT TI	BSC (WESTERN MICHIGAN) (ELECT, 2000)
	Mechanical Engineering	
20097	MOHD FAUZI BIN SHAFIE	BE (HONS) (UPM) (MECH SYST, 94)

NEW APPLICANTS

Name	Qualifications
Civil Engineering	
CHONG POH TING	BE (HONS) (UTM) (CIVIL, 94)
MUTHAMIL SELVEN A/L K. PALANIAPPAN	BE (HONS) (UTM) (CIVIL 2001)
NOR AZLAN BIN YUSOFF	BSC (MISSOURI) (CIVIL, 88)
Electrical Engineering	
KOAY YEE SIAN	BE (HONS) (LIVERPOOL) (ELECT & E'TRONIC, 98)
ROBERT WAN	BE (SOUTH AUSTRALIA) (ELECT, 96)
Electronic Engineering	
NAGESPARAN A/L AINARAPPAN	BE (HONS) (MANCHESTER METROPOLITAN) (COMM & E'TRONIC, 99)

ADMISSION TO THE GRADE OF GRADUATE (ERRATA)

Name	Qualifications
Civil Engineering	
WONG MIN HWA, PETTER	BE (HONS) (MANCHESTER) (CIVIL, 2000) PHD (MANCHESTER) (2004)

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IEM TRAINING CENTRE SDN. BHD. (127273-K)

1009A, 9th Floor, Block E, Kelana Parkview Tower,
No. 1, Jalan SS 6/2, Kelana Jaya, 47301 Petaling Jaya, Selangor Darul Ehsan
Telephone No. 03-78049851 Fax No. 03-78049131 E-mail: iemtc@mail.ru

FEBRUARY 2006		
COURSE TITLE	**DATES**	**VENUE**
BEM Mandatory Course – Safety & Health At Work	13 & 14 February	IEM Training Centre
Contract Administration For Site Personnel In Engineering & Construction Contracts	15 & 16 February	Kota Kinabalu
BEM Mandatory Course – Engineering Management Practice Practical Rock Engineering with Q in Tunnel Design And Execution Using	16 & 17 February	IEM Training Centre
TBM And Drill-and-Blast Methods	20 & 21 February	IEM Training Centre
BEM Course – Code of Ethics/Regulations	22 & 23 February	IEM Training Centre
Energy Conservation & Cost Savings Strategies For The Design & Operation Of Air Conditioning Systems	22 & 23 February	Kota Kinabalu
BEM Mandatory Course – Safety & Health At Work	24 & 25 February	Kota Kinabalu

MICROSOFT CLASSES			
COURSE TITLE	**FEES**	**FEBRUARY**	**MARCH**
Microsoft Word 2000 (Basic & Intermediate)	350	6 & 7	6 & 7
Microsoft Word 2000 (Advanced)	350	20 & 21	20 & 21
Microsoft Excel 2000 (Basic & Intermediate)	350	8 & 9	6 & 7
Microsoft Excel 2000 (Advanced)	390	22 & 23	22 & 23
Microsoft PowerPoint 2000 (Basic/Intermediate)	200	10	10
Microsoft PowerPoint 2000 (Advanced)	200	24	24
Microsoft Access 2000 (Basic/Intermediate)	350	13 & 14	13 & 14
Microsoft Access 2000 (Advanced)	750	27 – 1 Mar	27 - 29

For more information and registration, please contact IEM Training Centre Sdn. Bhd., address, telephone number, fax number and email address as per letterhead.

CONGRATULATIONS MESSAGE

The Standing Committee on Information and Publications would like to congratulate the following members for completing the IEM Readership Survey 2005 in time and winning the Lucky Draw for the limited prizes.

3 x 256 MB USB Thumb Drive

1) Ir. Fuad bin Abas (F05492)
2) Ir. Lee Lih Cheran (M03726)
3) Ir. Ku Mohammad Sani bin Ku Mahmud (M22008)

10 x IEM Souvenir

1) Ir. Selva Gunalan s/o Seliah (M16630)
2) Ir. Dorhat bin Rahani (M06664)
3) Ir. Hong Kok Kiong (M19304)
4) Ir. Ngo Kia Sing (M16907)
5) Ir. Noorul Nazir bin Mohd. Noor (M24803)
6) Ir. Tey Kim En (F04781)
7) Ir. Gu Hock Soon (M05706)
8) Sdr. Ng Tien Giem (G19680)
9) Ir. Khairulezuan bin Harun (M12874)
10) Ir. Boon Suan Duan (M08171)

To all the others who have also returned their survey forms, we thank you for your effort and time to contribute towards the success of the survey.

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IEM DIARY OF EVENTS

For further enquiries on the events below, please contact IEM Secretariat at 03-7968 4001/2 or visit IEM Homepage at http://www.iem.org.my

Water Resources Technical Division
13 FEB 2006
Time: 5.30 p.m. - 7.30 p.m.
Talk on Application of Rainwater Harvesting as a Tool for Managing water Resrouces and Environment

Mechanical Engineering Technical Division
14 FEB 2006
Time: 5.30 p.m. - 7.30 p.m.
George Stephenson Lecture: Engineering the Ultimate Reality Show

15 FEB 2006
Time: 5.30 p.m. - 7.30 p.m.
Talk on the Concept and Practice of Demand Side Management – The UK Experience

Oil, Gas and Mining Technical Division
17 FEB 2006
Time: 5.30 p.m. - 7.30 p.m.
Talk on Surge Protection of Fire Alarm Systems

Electrical Engineering Technical Division
22 FEB 2006
Time: 9.00 a.m. - 1.00 p.m.
Visit to MEWC Low Energy Office Building in Putrajaya
(*limited to 30 participants only*)

Civil and Structural Engineering Technical Division
23 FEB 2006
Time: 5.30 p.m. - 7.00 p.m.
Talk on "Mitigation Against Earthquake Using Rubber Bearings"

Project Management Technical Division
24 FEB 2006
Time: 5.30 p.m. - 7.30 p.m.
Talk on "Delay in Government Construction Projects: What is the Main Cause?"

Graduates & Students Section
24 FEB 2006
Time: 6.30 p.m. onwards
IEM Bowling Tournament 2006

25 FEB 2006
Time: 9.00 a.m. - 5.00 p.m.
Take Charge! A One-Day Personal Development Workshop

Tunnelling and Underground Space Technical Division
20 - 21 FEB 2006
Practical Rock Engineering with Q in Tunnel Design and Execution Using TBM and Drill-and-Blast Methods

4 MAR 2006
Time: 9.00 a.m. - 11.30 a.m.
Half Day Seminar on "An Overview of Trenchless Technology"

4 MAR 2006
Time: 11.45 a.m. onwards
6th AGM of the Tunnelling and Underground Space Technical Division

Branches
IEM PERAK BRANCH
6 - 7 MAR 2006
2-Day Conference on Landslite, Sinkhole, Structure Failure: Myth or Science?
Casuarina Hotel, Ipoh, Perak Darul Ridzuan

CONFERENCES FOR 2006

28 FEB 2006
IEM/MFPA Seminar on Updates of Malaysian Standard in Fire Alarm and Smoke Control Systems
City Bayview Hotel, Penang

28 FEB 2006
6 - 9 MARCH 2006
Time: 7.30 a.m. - 5.00 p.m.
International Conference and Exhibition on Tunneling and Trenchless Technology
Sheraton Subang Hotel

6 - 7 MARCH 2006
International Conference on Landslide, Sinkhole, Structure Failure: Myth or Science?
Royal Casuarina Hotel, Ipoh, Perak

18 MARCH 2006
IEM Golf Competition/Circuit
KGSAAS

20 - 25 MARCH 2006
Engineering Week

22 APRIL 2006
AGM & 47th Annual Dinner and Awards Night
IEM and Palace of the Golden Horses

7 MAY 2006
Open House
JKR Hall, Dewan Tan Sri Mahfoz Kahlid

8 - 12 MAY 2006
IEM/BEM Exam

9 - 11 MAY 2006
Conference on Concrete Engineering and Technology (CONCET)
Sheraton Subang Hotel

22th- 26 MAY 2006
11th Asian Congress on Fluid Mechanics
Berjaya Times Square Hotel and Convention Centre

23 - 24 AUGUST 2006
National Food Production and Processing Conference
Equatorial Hotel, Bangi
Call for Papers (1st Bulletin)

27th- 30 AUGUST 2006
11th APCChE Congress
Kuala Lumpur Convention Centre (KLCC)

28 AUGUST 2006
IEM/IES/PII Tripartite Meeting
Kuala Lumpur Convention Centre (KLCC)

28 AUGUST 2006
5 - 7 SEPTEMBER 2006
Brownfield Asia 2006 - International Conference on Remediation and Management of Contaminated Land: Focus on Asia
Berjaya Times Square Hotel and Convention Centre

24 - 25 OCTOBER 2006
Conference on Current Trends in Food Engineering

29 NOVEMBER – 2 DECEMBER 2006
24th Conference of ASEAN Federation of Engineering Organisation (CAFEO)
DoneChan Palace Hotel, Vientiane Capital, Laos

CONFERENCES FOR 2007

8 - 11 MAY 2007
16th Southeast Asian Geotechnical Conference (SEAGC 2007)
Venue : Sheraton Subang Hotel & Towers, Subang Jaya
E-Mail : 16seagc@iem.org.my
Website : http://www.16seagc.com
(Call for Papers)

1 - 5 AUGUST 2007
3rd World Engineering Congress (WEC)
Venue : Penang

CONFERENCE & SEMINAR

MALAYSIA
23 - 25 February 2006
MALAYSIA TECHNOLOGY EXPO (MTE) 2006
Venue : PWTC, KL
Organiser : MOSTI, MARS
Tel : 03-7727 2828
Fax : 03-7727 2566
E-mail : melissa@protemp.com.my
Website : www.mte.org.my

4, 11, 18, 25 March & 1 April 2006
INDUCTION COURSE FOR NEW M&E ENGINEERS
Venue : Women's Institute of Management, TTDI, KL
Organiser : ACEM
Tel : 03-2095 0031
Fax : 03-2095 3499
E-mail : sec@acem.com.my
(Invitation to Register - before 24 February 2006)

3 - 5 July 2006
INTERNATIONAL CONFERENCE ON SLOPE MALAYSIA 2006
Organiser : Ministry of Works Malaysia, JKR, REAM
Tel : 03-2696 7351
Fax: 03-2692 7010
E-mail : HANADZRI@jkr.gov.my; AbHamid@jkr.gov.my
(Call for Papers - before 15 December 2005)

5 - 6 September 2006
6TH ASIA PACIFIC STRUCTURAL ENGINEERING AND CONSTRUCTION CONFERENCE 2006 (APSEC 2006) – "CHALLENGES TOWARD SUSTAINABLE CONSTRUCTION"
Organiser : JKR, CIDB, UTM, CTMC STC
Tel : +607-553 1505 /+607-521 8182/59
Fax: +607-521 1355
E-mail : APSEC2006@utm.my
Website : http/www.spaceutm.edu.my/seminar
(Call for Papers - before 15 February 2006)

KOREA
22 - 27 April 2006
ITA-AITES WORLD TUNNEL CONGRESS & 32ND ITA GENERAL ASSEMBLY
Organiser : KTA, ITA
Tel : +82-2-726-5554/5558
Fax: +82-2-778-2514
E-mail : ita2006@hanjinpco.com
Website : http/www.ita2006.com
(Invitation to Register - before 31 January 2006)

UK
1 - 3 November 2006
SIEMENS TRANSPORTATION SYSTEM: EXPORAIL 2006
Organiser : Restec Brooks Exhibition
Tel : +44 (0) 1273 300 434
Fax: +44 (0) 1273 300 986
E-mail : exporail@mackbrooks.com
Website : http/www.exporail2006.com

ANNUAL DINNER AND AGM OF BRANCHES – YEAR 2006

Annual Dinner	Miri Branch	April
AGM and Annual Dinner	Negeri Sembilan Branch	May
AGM and Annual Dinner	Southern Branch	June
AGM and Annual Dinner	Perak Branch	July
AGM	Sabah Branch	October
Annual Dinner	Sabah Branch	November
AGM and Annual Dinner	Penang Branch	November
AGM and Annual Dinner	Kedah/Perlis Branch	December
AGM and Annual Dinner	Sarawak Branch	December
AGM	Miri Branch	December
AGM and Annual Dinner	Terengganu Branch	December
AGM and Annual Dinner	Melaka Branch	December
AGM and Annual Dinner	Eastern Branch	TBA

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DONATED BY ITSIG TECHNICAL DIVISION

HACKING EXPOSED FIFTH EDITION:
NETWORK SECURITY SECRETES AND SOLUTIONS
STUART MCCLURE / JOEL SCAMBRAY / GEORGE KURTZ / MCGRAW HILL
681.324 MCC / 004710

The fifth edition of this world-renowned security reference offers completely up-to date coverage of today's most devastating hacks and how to prevent them. Using the proven hacking exposed methodology, the book shows you, step by step, how to locate and patch system vulnerabilities and explains what you need to know to stay vigilant in today's 24 x 7 digital world.

VISUAL QUICKSTART GUIDE GOOGLE AND OTHER SEARCH ENGINERS
DIANE POREMSKY / PEACHPIT PRESS
681.324 POR / 004684

Teach yourself how to search the web the quick and easy way. This visual quickstart guide uses pictures rather than lengthy explanations. You'll be up and running in no time.

- take an easy, visual approach to teaching you how to search the Web, using pictures to guide you and show you what to do - works like a reference book – you look up what you need and then get straight to work
- no long-winded passages – concise, straightforward commentary explains what you need to know
- affordably priced, because buying a computer book shouldn't be an investment in itself

SAMS TEACH YOURSELF PHP IN 24 HOURS – 3RD EDITION
MATT ZANDSTRA / SAMS
681.324 ZAN / 004695

In just 24 lessons of one hours or less, you will be up and running with PHP. Using a straightforward, step-by-step approach, each lesson builds upon the previous one, allowing you to learn the essentials oh PHP form the ground up.

MOTOR CONTROL ELECTRONICS HANDBOOK
RICHARD VALENTINE / MCGRAW HILL
621.46 TIL / 004669

This book gives you expert design and application help in controlling all types of motors – with precise, adaptable intelligence. Featuring the latest in electronics technology from the best and brightest in the business, this expert guide gives you everything form the fundamentals to cutting-edge design tips, including real-life examples with software code.

More and more critical in motor design, sophisticated electronic controls provide greater efficiency, finer speed and torque regulation, and better motor protection. With this insider's guide to electronic control technology, you'll be ready to make motors work better now and into the future.

CREATING WEB-BASED LABORATORIES
CC KO / BEN M.CHEN / JIANPING CHEN
681.324 KO / 004679

Remote web-based experimentation, enabling students and researchers to access the laboratory anytime via the internet, is becoming an increasingly attractive way to complement or even replace traditional laboratory sessions. Placing a video camera and microphone before the equipment and apparatus to capture what is actually happening in the laboratory allows the images and audio data to be streamed to the client side – whether this is in a nearby room or on the other side of the world. Researchers in different countries can share equipment and conduct research cooperatively and remotely.

Students, engineers, researchers and teaching professionals working in areas related to the internet, distance education and collaborative research will find creating web-based laboratories very useful reading. It also provides a good reference for those interested in hoe hardware and software can be integrated to form a web-based experimentation system.

SAMPLING AND ANALYSIS OF ENVIRONMENTAL CHEMICAL POLLUTANTS: A COMPLETE GUIDE
EMMA P. POPEK / ACADEMIC PRESS
681.324 POR / 004670

This handbook offers a common sense, practical approach to project planning, fieldwork and data interpretation and provides detailed procedures for sampling of key environmental matrices. Special features include:

- Encompasses project planning, environmental sampling, laboratory analysis and data quality assessment
- Step-by-step sampling procedures for soil, water and wipe sampling
- Practical tips on planning, sampling interactions with the analytical laboratory, and data quality evaluation
- Accessible to environmental professionals of all disciplines

In a clear and logical manner, this comprehensive guide presents everything an environmental professional needs to know to competently collect environmental chemical data. Stripping away the layers of inapplicable or irrelevant recommendations form existing protocols, the guide centers on the basic underlying principles of environmental sampling and analytical chemistry, and summarises the universally accepted industry practices and standards.

REVETMENT SYSTEMS AGAINST WAVE ATTACK – A DESIGN MANUAL
KIRSTY MCCONNELL / THOMAS TELFORD
627.58 MCC / 004725

A wide range of revetment systems are used to provide protection against wave attack, and many different materials and methods may be used in their construction.

Revetment system against wave attack discusses the functions of revetments and the different aspects of structural performance, and includes example specifications and calculations. This enables the engineer to choose the most stable, appropriate and cost effective revetment system for a given situation. The book guides the engineer through the design process, form identifying hydraulic loading conditions and initial dimensioning of the revetment elements to detailed design of the revetment elements to ensure adequate protection against design wave condition.

Note: IEM Library is open from 9.00 a.m. to 6.00 p.m. (Mon - Fri)
9.00 a.m. to 4.00 p.m. (Every Saturday)

GENERAL ANNOUNCEMENT

Effective from 1 January 2006, IEM will charge non-IEM Members RM 20.00 for participating in its evening talks and visits. For IEM Members, membership cards should be presented for identification purposes, failing which the participant will be deemed as a non-IEM Member and be required to pay the non-IEM charge.

ERRATA

In the **January 2006** issue of **JURUTERA**, on **page 28** under the article entitled "*The Unseen Flood: Waterlogging in Large Oil Palm Plantations*", we incorrectly attributed the salutations of the authors. it should read:

By: ***Sdr.*** *Lee Wei Koon and* ***Sdri.*** *Ong Boon Kun (UiTM)*

In the same issue, on **page 35**, under the report entitled "*Aspiring Engineers Today, Great Leaders Tomorrow!*", the authors name should read:

Sdr. Kok Yen **Kwan** instead of "*Sdr. Kok Yen Kuan*"

The Editorial Board apologises to Sdr. Kok for the error.

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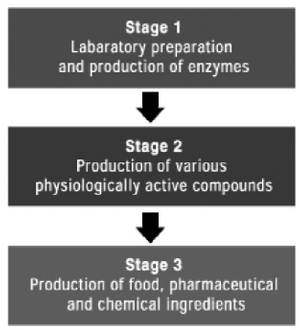
Technical Visit to Stevian Biotechnology Corporation Sdn Bhd, ENSTEK

By: Ir. Dr Luqman Chuah bin Abdullah

On 3rd of September 2005, a technical visit was organised by the Chemical Engineering Technical Division, IEM to Stevian Biotechnology Corporation Sdn. Bhd., ENSTEK. The visit started at 10.00 a.m. when we arrived at Stevian Headquarters located in Labu, Negeri Sembilan. The group consisted of 36 IEM members including 1 secretariat staff from IEM. We were warmly greeted by the PR officer from Stevian and a video session that introduced the corporate background and the activities of Stevian was presented.

Stevian Biotechnology Corporation Sdn. Bhd. is a pioneer biotechnology company in the South-East Asian region with large investments in a polyfunctional biotechnology plant in Malaysia capable of producing enzymatically enhanced natural sweeteners and a whole range of biochemical products and derivatives. **Stevia (Stevia rebaudiana)**, a small bush native to Paraguay, where the leaves of this plant contain carbohydrate-based compounds 200-300 times sweeter than sugar. These compounds, steviosides, can be extracted and used as alternative sweeteners to sugars.

The company products, enzymatically enhanced natural sweeteners, contain zero calories and can be used as a sugar substitute in cooking and baking. They are especially beneficial to diabetics and those wishing to reduce sugar intake for health reasons. Its primary use is as a sweetener to enhance the palatability of food and drinks. Unlike aspartame, Stevia sweeteners are heat stable to 200 degrees centigrade, are acid stable and do not ferment, making them suitable for use in a wide range of products.



Stage 1 involves the growing and preparation of microbes in a controlled laboratory environment by STEVIAN's scientists. The microbes are catalyst for producing various enzymes for use in Stage 2 of the production process.

Stage 2 involves the production of various intermediate products, which are basically derivatives of bioorganic and physiologically active compounds, used in the production of other products. These intermediate products would either be used internally in producing/treating Stage 3 products (such as the use of BCD for treating and purifying Steviosides) or sold externally. Beside BCD, other intermediate products that STEVIAN intends to produce are alpha-cyclodextrins, gamma-cyclodextrins, various industrial enzymes and cyclodextrin derivatives.

Stage 3 involves enzymatically treating and purifying products, which includes Steviosides and other products to improve their product quality. In the case of Steviosides, STEVIAN would procure crude Steviosides which would be enzymatically treated to improve their quality by removing the bitter after taste.

The visit continued with the pilot plant tour in Stevian. The engineers and manager have explained the operation of the pilot plant and the production of enzymatically enhanced natural sweeteners that have been carried out using the pilot plant. Refreshment was given to the members after the tour. The members benefited from the visit and the visit ended at 1.30 p.m. ■

Tunnelling & Underground Space Technical Division

Tunnel Construction

By: Ir. Neo Boon Kheng

Pantai Trunk Sewer is 5.4km long, starting from the upstream of Klang River adjacent to Jalan Sulaiman Bridge and runs along Jalan Syed Putra and Federal Motors and where it crosses the river before going under the KTM and ERL tracks in Brickfields. The tunnel then continues through Kampung Haji Abdullah Hukum and Federal Highway close to the Mega Mall and passes behind KTMB Angkasapuri Station, and connecting to Pumping Station in Pantai Dalam STP.

The trunk sewer is to be constructed using the shield tunnel method using two Earth Pressure Balanced Boring (EPB). Due to the geological conditions identified from the soil investigation, the TBM has been fitted with roller cutter bits as well as scraper bits which enables it to cut through the soft rock of the "Kenny Hill formation". The TBM uses hydraulic rams to push itself forward enabling the rotating cutter head to excavate the soil which falls into the cutter chamber. This soil is then discharge from the chamber using a screw conveyor which dump the soil into rail mounted muck skips that are pulled to the shaft.

Having excavated 1m, a space is available at the rear of the machine to erect a pre-cast concrete ring which forms the primary segment lining, made up of 5 segments which are built inside the protection of the TBM shield using the handling erector. Each piece is bolted to adjacent segments/rings using a curved 24mm diameter bolt. The joint between each segment has hydrophilic seal attached which swells should any ground water leak into the tunnel from outside therefore increasing water tightness.

Once the ring has been built the hydraulic rams are once again extended and the TBM excavates another 1m, enabling the subsequent ring to be erected. Since the ring is built inside the outer diameter of the excavation, it is larger than the outer diameter of the ring which leaves the void. This void is filled with a cementitious grout as the TBM advances so that surface settlement is reduced. The cement also helps to keep ground water away from the tunnel therefore reducing leaks. The grout is pumped through a hole cast in the segments directly into the void area just at the rear of the TBM. A non return valve is fitted to the grouting port to ensure that water or grout does not leak back into the tunnel.

Once the tunnel excavation and initial lining is completed, the TBMs are removed and a secondary lining is constructed. The secondary lining forms a corrosion protection system which is designed to prevent the gases formed from the sewage from eroding the structural concrete. The lining will be formed by 2.5 m pre-cast concrete pipe with a 1.5mm thick layer of HDPE on the inner surface which is completely resistant to attack. The pipe will be transported into the tunnel and jointed by welding the HDPE sheets together thus forming a water tight lining designed to last over 100 years. ■

Report on IEM-MSIA Seminar on Site Investigation Practice

By: Ir. Lee Eng Choy

One hundred and forty (140) participants attended a seminar on Site Investigation practice on 9 August 2005 at Armada Hotel, Petaling Jaya. The seminar was jointly organised by the Geotechnical Engineering Technical Division of IEM and the Malaysian Site Investigation Association (MSIA).

Four technical papers were presented, the first of which is a paper by Ir. Neoh Cheng Aik on Guidelines for Planning Scope of SI Works for Road Projects. Ir. Neoh elaborated at length on the "do's and don'ts" in planning site investigation works. He discussed the guidelines for the planning of the scope of site investigation works for road projects as contained in the document as published by REAM. He also elaborated on the practical aspects of site investigations, including the appropriate technicques for sampling, in-site and laboratory tests, etc.

The second paper was delivered by Ir. Liew Shaw Shong on Common Problems on Site Investigation Works in a Linear Infrastructure Project, which includes such projects as transportation, transmission and utility infrastructure projects. Ir. Liew discussed at length the pitfalls that are encountered on these works and the mitigating measures that could be taken to overcome them. In his discussion, he illustrated how adequacy in desk study could be useful in identifying the potential problem areas and would help greatly in determining the appropriate scope of site investigation works to be carried out. Ir. Liew also stressed the usefulness of carrying out multi-stage site investigation works as opposed to a single-stage investigation. The continuous investigation, extending into the construction phase would be extremely useful, especially when complex geological features could only be identified upon exposure during excavation.

En. Abd. Rasid Jaapar from MSIA next presented the State of Site Investigation Practice in Malaysia. He began with an historical account of the development of site investigation practice in Malaysian and continued with the discussion on the present state of practice. He highlighted that the practice of site investigation in the country has deteriorated over time. En. Rasid discussed a wide spectrum of the practice, from the very beginning pre-contract stage until the report preparation and submission. He discussed the major issue on unreliable site investigation and the deviation of local practice as compared to standard or international practice. En. Rasid then went on to discuss the commercial considerations as well as the recommendations for the improvement of the management of site investigation works.

Next, En. Hamidan Mat Wajib of MSIA discussed the Steps taken by MSIA to improve the Site Investigation Industry. He discussed the current status and future development on the steps taken by the Malaysian Site Investigators Association (MSIA) to improve the site investigation industry in Malaysia. En. Hamidan indicated that MSIA, being a new association, would collaborate with other organisations as a first step in its task. In his presentation, he indicated that one of the collaboration with CIDB is in establishing the National Occupational Skills Standard (NOSS), which would benefit the industry in producing skilled workers for site investigation works. He also discussed some suggestions and recommendations to improve the site investigation industry.

A forum was also arranged to discuss current issues pertaining to site investigation practice for road works. Representatives from BEM, IEM, ACEM, MSIA, JKR and IKRAM formed the panelists for the discussion session, chaired by Ir. Neoh Cheng Aik, representing REAM. The panelists presented several views concerning the practice of site investigation in this country. Some discussions were carried out following the presentations by the panelists.■

Electrical Engineering Technical Division

Report on 9th Raja Tan Sri Ir. Zainal Lecture

By: Ir. Mah Soo

The Raja Tan Sri Ir. Zainal lectures have been conducted traditionally once a year with the aim of giving students an insight to the engineering discipline and hence stimulate their interest to pursue engineering as their career and profession.

This year, the lecture was held on Saturday, 3 September 2005 at the Cititel, Mid Valley, Kuala Lumpur. The Chairman of the IEM Electrical Engineering Technical Division, Ir. Yusouf bin Ahmad gave the opening remarks before introducing the Speaker, our distinguished immediate Past President of the IEM, Ir. Prof. Abang Abdullah bin Abang Ali. The lecture attracted 250 participants. Though the audience was traditionally students, this year we were surprised to find that there were engineers in the audience as well.

Ir. Prof. Abang gave a presentation on the "Role of Engineers in Capacity Building". The presentation started off with an introduction to the evolution of engineering and technology and engineering feats and achievements. It was then followed by a discussion on knowledge-based global businesses, engineering in the modern world, the engineering team and the capacity building initiatives before ending off with the mutual recognition agreements and mobility forums. Ir. Prof. Abang Abdullah then summarised his presentation with the emphasis that "It is important that we engineers, as the biggest professional group in the country, strive to develop a comprehensive plan for producing the next generation of the engineering team, a new breed of professionals and sub-professionals who are multi-skilled, at the forefront of knowledge and technology and capable of becoming future captains of industry."

The lecture was well received and invited numerous questions from the floor both from the students and the engineers. The questions touched on the following topics:

1. How to get IEM to give career talks to schools during their schools' Career Week?
2. Why there seemed to be more female students than male students in universities? What about in engineering courses?
3. Can students with polytechnic diplomas apply to become Student Members of the IEM?
4. How to become a Professional Engineer?
5. Continuing Professional Development?

The lecture ended at 1.00 p.m. with Ir. Yusouf bin Ahmad presenting a momento to Ir. Prof. Abang Abdullah bin Abang Ali and the usual round of applause to show appreciation for his informative and interesting lecture. ■

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Report on One Day Technical Seminar – "A Great Place to Work" – held at IEM PJ on 4 August 2005

By: Ir. Dr Ng See Seng

Ir. Soong P. S. spoke on the topic "Incorporating Air and Water Quality in Design".

Both flushing (to remove dirt and debris from the piping system) and chemical cleaning (to remove oxides, oil and grease from metal surfaces) of a Heating, Ventilation and Air Conditioning (HVAC) System require plenty of water and detergents. Water discharged from such processes does not meet the Environmental Quality Act.

To overcome this dilemma, various devices like filters, back wash tank, sludge holding tank, chemical reactor and filter press were highlighted in order to i)reduce water consumption and thus the discharge; ii)to meet regulatory requirements.

Both the condenser and chilled water of a HVAC system were covered by the speaker and actively debated upon subsequently.

The next speaker presented a paper entitled"How healthy is the air around you?" Dr M. Omar classified air into Outdoor and Indoor Air. Indoor air is further sub-divided into Commercial, Domestic and Education, depending on how a building is being utilised. He emphasised that indoor air can be many times more polluted than outdoor air. This is because indoor air contains the sum of the outdoor pollutants (as a result of ventilation) and the substances generated by building occupants and their activities. Some of these come from food preparation, fuel burning, tobacco smoke, hair sprays, detergents, paints, pesticides, etc. Other pollutants include particles from manufacturing processes. Generally, pollutants can be classified into:

i) environmental tobacco smoke;
ii) biological like bacteria and fungus;
iii) carbon monoxide;
iv) formaldehyde;
v) volatile organic compounds;
vi) asbestos.

As a result of these pollutants, many people who live or work in air conditioned spaces experienced physical discomfort and this leads to the phrase – "Sick Building Syndrome".

The third speaker, Mr. Mok Chee Meng, spoke on "Special Air Filtration and Treatment". He introduced a piece of equipment which can measure up to 6 parameters of indoor air quality, viz., carbon dioxide, carbon monoxide, VOC, formaldehyde, temperature and humidity. Another can measure Ozone, Total bacteria and Fungus counts.

During a sneeze, tiny droplets of water and mucus are expelled. These airborne particles may contain viruses like chickenpox, flu, measles, smallpox, etc. and/or bacteria like meningitis, pneumonia, tuberculosis, etc.

Using a porous Copper/Silver Portable Air Cleaner, bacteria count was reduced tremendously from 12,000 cfu/m^3 to 10. Similarly for a conference room of 12ft x 14ft size, sub-micron dust particles were reduced to less than 10% in 60 minutes.

A Centralised Electronic Filtration system achieves comparable results, in the order of 96.6% for sub-micron dust particles.

Centralised air sterilisers utilising UV radiations can reduce airborne bacteria from about 40 to 80% based on measurements conducted in Singapore.

Ozone can be an effective bactericide too but the downside is that it causes secondary contamination for breathing air.

En. Redzwan Hj. Hussain spoke on the topic "Perspective from the Authorities". The Occupational Safety and Health Act 1994 encompasses the following:

i) Duties of Employer – Section 15
   - Ensure workplace is safe and without risk to health
ii) Control and approach
   - Safety and Health policy;
   - Safety and Health Officer;
   - Safety and Health Committee;
   - Factories and Machinery Regulations, 1970;
   - Chemicals Hazardous to Health Regulations 2000;
   - Indoor Air Quality, Code of Practice 2005.

According to the speaker, the IAQ Code of Practice was approved in early August 2005. The list of air pollutants and their maximum limits are as follows:

Indoor air pollutants	8-hr TWA*
Carbon dioxide	1,000ppm
Carbon monoxide	10ppm
Formaldehyde	0.1ppm
Respirable particulates	0.15mg/m^3
Total VOC	3ppm

* *Time Weighted Average*

Dr Stacey Yong spoke on "The Unseen Water Hazard".

Legionella organisms are naturally occurring bacteria that are widespread in natural settings as well as certain environments created as a result of human activity, such as in cooling towers.

One of the species of this organism, Legionella pnuemophila, can cause an acute pneumonia called legionnaires disease or a febrile illness termed Pontiac fever. Transmission of the disease is associated with infected aerosols, water spray and mist; the bacteria being carried to the lungs on tiny droplets. Biofilms and sediments in plumbing systems are potential niches for the multiplication of Legionella when water temperatures are between 25 and 45 deg C.

Dr Lee Poh Hoon's topic was "Water and Energy Savings with Effective Condenser Water Treatment Program".

She stated that the performance of a heat exchanger especially the water-cooled condenser in a HVAC system is very much affected by scaling, corrosion and microbiological growth. These inhibitive factors arise from Mechanical, Operational and Chemical constraints.

Left unchecked, scaling, corrosion and microbiological growth may cause the following:

i) Loss of heat transfer
ii) Reduced equipment life
iii) Equipment failures
iv) Lost production
v) Lost profits
vi) Increased maintenance costs
vii) Plant shutdown

A total system approach utilising the 3D TRASAR can manage those stresses. It works in the following manner:

i) continuously measures the key performance parameters related to system stress
ii) detects upset conditions
iii) automatically takes appropriate corrective actions
iv) communicates with system users

Mr Rob Moult's topic was "Application of Building Automation Systems to HVAC and Water Management". He believes that modern efficient Building Automation System (BAS) provides building owners and operators value-added features and functions in a building than that of the conventional ones. That includes:

i) Monitoring and controlling energy usage;
ii) Improving effectiveness of building operators;
iii) Automatically controlling building systems so they work as a team;
iv) Supporting a modern maintenance programme.

For HVAC system, BAS can specifically be used for Energy Management, Operations and Maintenance.

In energy management, BAS can trigger an alarm when daily energy consumption is too high or when there is a risk of not achieving energy savings target.

For operations, BAS gives advance warning of problems when CO_2 level exceeds 1000 ppm, indicating insufficient ventilation.

For maintenance, BAS gives advanced warning of problems when a differential pressure of 1" across a filter indicates that the filter is dirty and should be changed. ■