

IStructE Singapore Division Members' Night Friday 2nd September 2011



Members' Night 2011

The 2011 Annual Members' Night was held on 2nd September 2011 at the M Hotel, Singapore. This regular annual event provides an avenue for IStructE members in Singapore to interact with each other in a relaxed atmosphere and to receive updates on major activities in the year ahead. It is also a great opportunity for the IES/IStructE Joint Committee to seek the views/comments from members on activities to meet the needs of members in Singapore.

This year, Members' Night was attended by more than 80 IStructE members and invited guests. This annual event will, in future, be held within the first 2 weeks of September after the announcement of the CME results. This year, the programme includes:

- Introduction of the three 2011 IStructE Gold Medallists from National University of Singapore, Nanyang Technological University and Singapore Polytechnic;
- Presentation of Service Award Certificates to selected members of the Joint Committee;
- Presentation of Congratulatory Certificates to successful April 2011 Chartered Membership Exam (CME) candidates;
- Presentation of Best Paper Award to authors of papers published in the IES Journal Part A (2009-2010);
- Presentation of Appreciation Gifts to IES staff, Angela Loke and Flora Wang for their administrative support;
- Address by eminent engineers on the topics of "Water Reclamation" and "Motor Car Racing";
- Musical presentation and rendition of the *Dizi* and other related Chinese woodwind instruments;
- Lucky draw – prizes include Proceedings of Conference on Structural Marvels, Guide to EuroCode4 and Hotel-sponsored promotional gifts;
- Brief summary of event announcements and an outline of the work of the IES-IStructE Joint Committee.

Among the special guests/members were Er. Ho Siong Hin (President of IES), Er. Lau Joo Ming (President, Professional Engineers Board), Er. Ho Wan Boon (President, Singapore Structural Steel Society), Prof Lee Seng Lip (Emeritus Professor at the National University of Singapore), all the 2011 CME successful candidates and the recipients of the 2011 IStructE Gold Medals from NUS, NTU and Singapore Polytechnic.

The IES-IStructE Joint Committee and all IStructE members congratulate Certificate and Awards recipients, successful members of the 2011 CME and 2011 Gold Medal winners.



Dear readers, Thank you for taking time to read this newsletter. We appreciate your continued support and would also like to hear from you for whatever reasons. Please direct all your correspondence and inquiries to:

IES/IStructE Joint Committee (2010-2011)

- Prof. Wang Chien Ming (Chairman)
ceewcm@nus.edu.sg
- Er. Dr. Ho Kwong Meng (Vice-Chairman)
hokm@starhub.net.sg
- Er. Dr. A/Prof. Lok Tat Seng (Hon. Secretary)
ctslok@ntu.edu.sg
- Dr. Boh Jaw Woei (Hon. Treasurer)
jwboh@hotmail.com
- Er. Wijaya Wong (Hon. Asst Secretary)
Wijaya.Wong@arup.com
- Er. Jeslin Quek (Hon. Asst Treasurer)
jeslinquek@fyfeasia.com
- Er. Leonard Heng
leonard@singnet.com.sg
- Er. Seow Hong Chiow
hc@sce.com.sg
- Er. Mak Yew Cheong
Mak.yew.cheong@pmlink.com.sg
- Er. Mah Guan Pang
maba.cnsac@pacific.net.sg
- Er. Ang Chee Keong
angcheekeong@gmail.com
- Er. Cong Zheng Xia
congzhengxia@yahoo.com.sg
- Er. Steve Yeung
Steve.Yeung@worleyparsons.com
- Er. Kang Jianhan
jianhankang@gmail.com
- Er. Reve Chin
Jen_yee_chin@hotmail.com

The Structuralist Editorial Sub-Committee

- Editor: Er. Kang Jianhan
- Advisors: Prof. Wang Chien Ming
- Er. A/Prof. Lok Tat Seng
- Dr. Boh Jaw Woei

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Photos Taken at the Members' Night



IStructE Joint Committee Members Celebrating Prof. Wang's Birthday



Dr. Ng How Yong giving a talk on water reclamation



Mr. Lim Keong Liam giving a talk on car-racing



Successful CME Members 2011 having a group photo with Chairman of Singapore Division



IES Staff Jasmine receiving an appreciation gift



Guests and Members at the buffet station



Musician displaying his mastery of the Chinese woodwind xylophone

Seminar

One Day Seminar on Underground Structures

A one-day seminar on *Underground Structures*, organized by IES/IStructE Joint Committee, was held on 19th May 2011 at the NUS Shaw Foundation Alumni House. About 300 participants attended this Seminar. In his welcome speech, Prof. CM Wang, Chairman of the Joint Committee gave an opening address, highlighting several examples of completed underground structures in Singapore. The mass rapid transport system, expressways, Kim Chuan MRT depot, rock caverns and large basements were typical underground structures.



The Participants at the Seminar

The first lecture entitled “Building Underground In Singapore – Opportunities and Challenges” was delivered by Prof. Lee Fook Hou (NUS). He highlighted several examples of structural and foundation failures and lessons learned in Singapore. This had prompted the establishment of a specialized registration scheme for professional geotechnical engineers in Singapore. This was followed by a lecture on “Key Design Components for Success in Deep Excavations in Singapore” by Mr Nick Osborne of Mott MacDonald Singapore Pte Ltd. He re-visited the allowable retaining wall deflection limitation and some pile design criteria. His illustration highlighted settlement and cracking of walls and floors of a church due to an adjacent deep excavation.



Prof. Wang Chien Ming

Prof. Lee Fook Hou

The third lecture was presented by John Davies of Arup Infrastructure Group. His paper entitled “Design of Cost Effective Cut and Cover Tunnel Excavations” focused on the Taiwan Kaohsiung Subway subsidence in August 2004, the Nicoll Highway collapse in April 2004 and movement of London Big Ben caused by the Westminster Station excavation. The circular diaphragm wall of the basements of Marina Bay Sands Integrated Resort was also discussed. The final lecture of the morning was presented by Dr Jack Pappin of ARUP and entitled “Design Procedures for Excavations and Lateral Support of Basements”. He discussed the background and purpose of the CIRIA C580 document, including the merits of, analysis and design methodology using C580, and application to Marina Bay Sands Integrated Resort. Jack is well-known in his work on the design and construction of the basements of Marina Bay Sands Integrated Resort.



Er. Wijaya Wong

Er. Dr. Ho Kong Meng

The afternoon sessions commenced with a presentation on “Underground Rock Cavern Development” by Mr Tan Wooi Leong of Jurong Consultants Pte Ltd. He outlined the “Hydrodynamic Containment Principle” and the construction methods of “Jurong Rock Cavern”. This was followed by a sixth and final presentation conducted jointly by Er. Chu Chiang Yong and Dr Zhou HanBin of Woh Hup on “Construction for Underground Structures – Contractor’s Experience To Share”. They presented several completed underground projects, including a circular diaphragm wall basement and the “bottom-up approach” for Duchess Station.

In his closing remark and on behalf of the Organizing Committee, Er. Dr Ho Kwong Meng, Vice-Chairman of the IES/IStructE Joint Committee, thanked all the speakers, participants, companies and supporting organizations of the Seminar. He also thanked the Tunnelling and Underground Construction Society (Singapore) as a partner in the seminar for their members.

Singapore Member Elected to IStructE Council

Dr Francis Lok, Honorary Secretary of the IES-IStructE Singapore Division, has been elected to serve IStructE Council from 2012-2014. He represents “Region 12, Asia and Pacific” and hopes to strengthen dialogue with partners in the region.

Francis has served in the Joint Committee since 1999. He is a registered Professional Engineer. He is committed to raising the standing of engineers and in promoting engineering education and life-long learning. He serves in several Panels of the Institution, including Registration and Licensing Panel and Applications and Professional Review Panel. The Committee is delighted to have a member of the Joint Committee represented in Council.



International Interest Group at the Institution of Structural Engineers

By Dr. Hirak Sen, PhD, DIC, MTech, FStructE, MICE, FIE, Chairman, International Interest Group, Council Member and Country Representative in India The Institution of Structural Engineers



The Institution of Structural Engineers currently has 26,000 members in 105 countries. Of these approximately two-thirds are from the UK and the Republic of Ireland and the remaining one-third from 103 countries across the globe. The International Interest Group (IIG) was established in 2009 to provide a forum for the non-UK and non-Irish Republic based members and other interested Council members to meet informally to assist the Institution in further developing its international profile. Three meetings are held each year, immediately prior to the Council meetings. The Group focuses on a number of issues including how to increase recognition of the Institution and its value, how to improve links globally, how to provide better services and value for non-UK members and how to expand the membership internationally.

At present IIG has members from 11 countries, namely, Australia, Canada, Caribbean, Hong Kong, India, Malaysia, New Zealand, Peoples' Republic of China, Singapore, South Africa and UAE.

Some 92 countries are currently not represented at IIG. Of these the following 13 countries have 10 members or more: USA, Cyprus, France, Spain, Sri Lanka, Nigeria, Germany, Kenya, Pakistan, Qatar, Thailand, Zimbabwe and Mauritius. Other countries that have fewer than 10 members and are not represented at IIG include: Andorra, Anguilla, Argentina, Austria, Azerbaijan, Bahrain, Belgium, Botswana, Brazil, Brunei, Cameroon, Canary Islands, Chile, Columbia, Czech Republic, Denmark, Egypt, Fiji, Gambia, Ghana, Gibraltar, Greece, Hungary, Indonesia, Iran, Isle of Man, Israel, Italy, Ivory Coast, Japan, Jordan, Kazakhstan, Kuwait, Lebanon, Lesotho, Luxembourg, Macau, Malawi, Malta, Monaco, Morocco, Netherlands, Norway, Oman, Peru, Philippines, Poland, Portugal, Rumania, Russia, Saudi Arabia, Serbia & Montenegro, South Korea, Sudan, Swaziland, Sweden, Switzerland, Syria, Taiwan, Tanzania, Turkey, Uganda, Vietnam, Yemen, and Zambia. This gives a sense of how large the Institution's membership footprint is.

As stated earlier, the primary focus of IIG is on how to raise the profile and membership base of the Institution globally. The present trend indicates that within the next five years the non-UK/ non-Irish Republic membership would cross 50% of total membership (from the present 33%). IIG discusses steps required to prepare the Institution for that stage and beyond.

IIG members discuss wide ranging issues that are mostly country neutral, but some are necessarily country specific. IIG also discusses structural events of international importance. For example, in its last meeting in July 2011, IIG discussed the devastating earthquakes in Christchurch and how New Zealand is preparing to rebuild its infrastructure and recommended that this was an area where the Institution could work on. At the same meeting, IIG also discussed the challenges faced during the 'management of the design of tall buildings in UAE' cutting across international boundaries and how a design team in UAE synthesizes inputs from various diverse countries. The meeting also considered a report on the 6th Asia Pacific Forum on 'Structural Engineering in Extreme Events' held in Queensland, Australia on 7 July 2011.

During the previous year 2010, it was noted in the Annual Report of the Institution for the year: "Internationally, enthusiasm for the Institution remains strong with particular interest and take-up of student membership in India. Elsewhere considerable progress is evident in working with regulatory authorities in China and the Institution's worldwide reputation enhanced through conferences held in Shanghai and Singapore organized by local members". IIG continues to endeavor to take this further.



IIG meeting held on 14 January 2011 at the Institution HQ: President Roger Plank, then clockwise: Dr. Hirak Sen (IIG Chairman), Paul Tsang, Matthew Esther, Professor David Lilley, Philip Sobers, Nick Russell (Vice President), David Lau, Martin Powell (Chief Executive), Allan Breton, Y K Cheng (Vice President), Dr. Peter Ho (not in seat), Tony Aimer, Alan Crossman (not in seat), Dr. Stuart Davis, Elizabeth Green, Dr. Sarah Buck (Past President), David Harvey (Past President), Tony Gibbs. Near window: Darren Byrne and Roger Knipe.

Chairman's report on his attendance of the International Interest Group and Council Meetings, 28-29 July 2011 at Eton Rowing Lake, Windsor.

I attended the International Interest Group and Council Meetings that were held at Eton Rowing Lake (a venue for the Olympic 2012 rowing competition).

The International Interest Group is headed by Hirak Sen (Chairman of the IStructE Indian Chapter). In the meeting, members from various overseas groups and divisions discussed on how to raise IStructE profile, attract new members, and to retain the enthusiasm of existing members. Interesting ideas that surfaced include having ambassadorial lectures given by eminent IStructE members who are visiting the countries of divisions/groups, staying engaged with the relevant local engineering institutions, societies

and authorities, developing e-distance learning packages for chartered examination courses and webinars and improving on the Institution web pages. The recommendations were submitted to the Executive Board for consideration.



Eton College Rowing Centre, the venue for Council Meeting and International Interest Group Meeting, July 2011

In the council meeting, President Roger Plank and Chief Executive Martin Powell gave a report on their plans and activities since January 2011. Council members discussed the changing role of structural engineers and how the Institution might need to adapt to provide appropriate engineering and technical support to members worldwide. Topics of breakout sessions include the challenges of behaving and delivering a truly international organization, advantage of synergies and potential value added for both memberships via mergers under the Institution's umbrella, and benefits of drawing companies into appropriate membership or affiliation with the Institution.

IStructE 6th Asia-Pacific Forum on "Structural Engineering for Extreme Events", In Gold Coast Australia

A team of engineers from the IES/IStructE Joint Committee attended the 6th APF 2011 held in Gold Coast's Griffith University, Australia on the 7th July 2011. The team comprises Prof. CM Wang, A/Prof. TS Lok, Er. Steve Yeung, Dr. JW Boh, Er. Wijaya Wong and Er. YC Mak. The team had a good time of learning from the various speakers. The theme being 'Structural Engineering for Extreme Events' was structured around the 4 elements of Water, Wind, Earth and Fire.

The recent floods in Brisbane, fires in Victoria Australia, Tsunami in Sendai, Japan and earthquakes in Christchurch, New Zealand formed the backdrop of the forum. They drew active interactions from the participants on the efficacy of flood protection and earthquake engineering. Climate change, stronger winds, larger floods and prediction of rising sea level were issues discussed and how engineers can mitigate the effects of these changes. It is something that engineers all over the world are concerned about and how to come up with innovative solutions to tackle these challenges and the updating of our design codes to cater for the changing environmental loads. There were no definitive solutions put forth which leaves ample room for participants to take home useful tools like risk assessment framework and work out solutions best suited for their environment. On a lighter note, innovative ways of measuring the dynamic structural properties of tall buildings to wind and vibrations was shared. The ingenuity of engineers is boundless! Failing which there was a topic on insuring against wind damage on building envelopes. Even the insurance industry works closely with structural engineers to mitigate and minimize damage by using code driven solutions that are affordable and safe.



Panel of Speakers responding to questions from the participants

News Flash

IStructE Gold Medal and Book Prize Winners 2011

IStructE Singapore Division is pleased to announce the winners of the 2011 IStructE Gold Medal and Book Prize Winners. The recipients are:

(1) Miss Liu Lihui (National University of Singapore)

Ms Liu Lihui is the recipient of IES/IStructE Medal and Prize 2011. She topped her cohort with First Class Honours in Bachelor of Engineering (Civil Engineering) garnering several academic awards - Lee Kuan Yew Gold Medal, IES Gold Medal, MSc(Constr Eng) Class of 1977 Silver Medal, PEB Gold Medal, Continental Steel Gold Medal and Book Prize, and Southeast Asian Geotechnical Society Medal. She was also in the Dean's List for many semesters throughout her study in NUS. She is currently working as a structural engineer in HDB Building Research Institute under the section named Professional Practical Scheme.



Miss Liu Lihui

(2) Mr Cheng Zhuoyuan (Nanyang Technological University)

Zhuoyuan is proud and honoured to be the recipient of the IES/IStructE Medal and Prize 2011. He is also presented with the prestigious Lee Kuan Yew Gold Medal and the TUCSS Geotechnical Engineering Cash Award during his Convocation on 27th July 2011. Zhuoyuan's interest in civil engineering developed while he was studying in Hwa Chong Junior College. During his study in NTU, he discovered that his interest tends towards the field of geotechnical and structural engineering. Zhuoyuan participated in the Undergraduate Research Experience on Campus programme and presented his Final Year Project on "Primary and Secondary Wave Propagation in Geo-materials". His findings will be presented at the 5th Asia-Pacific Conference on Unsaturated Soil later this year. Zhuoyuan has been awarded the Nanyang Graduate President Scholarship in 2011 to pursue a Doctor of Philosophy programme. Upon completion of his PhD, he intends to enter the civil engineering industry and contribute back to society.



Mr. Cheng Zhuoyuan

(3) Mr Wee Yi Nien (Singapore Polytechnic)

Yi Nien pursued his interest in structures after secondary school by enrolling into the Diploma in Civil Engineering & Management (DCEM) course at the Singapore Polytechnic. In May 2011, he graduated from the course with a Diploma with Merit for being in the top 5% of his cohort. Besides his studies, Yi Nien has actively participated in many overseas programmes such as competition, community service project and cultural immersion trips. He intends to pursue further studies in Civil Engineering at a local or overseas university.

The IES/IStructE Joint Committee congratulates all winners of the IStructE Gold Medal and Book Prize.



Mr. Wee Yi Nien

The IES/IStructE Best Paper Award 2009-2010

The IES/IStructE Joint Committee appointed a four-member panel to select three best papers from eight issues of the *IES Journal Part A: Civil and Structural Engineering* that were published in 2009 and 2010 for the IES/IStructE Best Paper Award 2009-2010. The panel comprises Er. Dr. Ho Kwong Meng, Er. Mak Yew Cheong, Er. Seow Heng Chiow and Er. Mah Guan Pang.

The selected papers for the aforementioned award are:

- **D.C. Pham, C.M. Wang and E.P. Bangun, “Experimental study on anti-heaving devices for very large floating structures”, *IES Journal Part A: Civil and Structural Engineering*, Vol. 2, No. 4, November 2009, pp. 255-271.**

The panel opines that the findings from the research as reported in this paper may benefit the maritime industries that are building pontoon-type very large floating structures for ferry and cruise terminals. By using anti-heaving devices attached to the floating structure, it would be possible to eliminate the need for an expensive breakwater.

- **Andrew Palmer, Seeram Ramakrishna, and Hassan Muzaffar Cheema, “Nuclear power in Singapore”, *IES Journal Part A: Civil and Structural Engineering*, Vol. 3, No. 1, February 2010, pp. 65-69.**

This article examines the possibility of providing Nuclear Power in Singapore. The paper has created a lot of interests and obtained many constructive opinions. For example, Singapore could partner a neighboring country to build a Nuclear Power Plant in a more remote area of our neighboring country and both countries could share the power generated.

- **Lau Joo Ming, Teh Poh Suan and Winston Toh, “HDB’s next generation of eco-districts at Punggol and eco-modernisation of existing towns”, *IES Journal Part A: Civil and Structural Engineering*, Vol. 3, No. 3, August 2010, pp. 203–209.**

Since more than 80% of Singaporeans live in Housing and Development Board (HDB) flats, the provisions for the next generation of eco-districts and eco-modernization of existing town will improve Singaporean’s quality of living. Furthermore, in order to create rapport from the HDB’s residents and to provide guidance for the construction professionals on their related HDB’s projects, this article is timely.

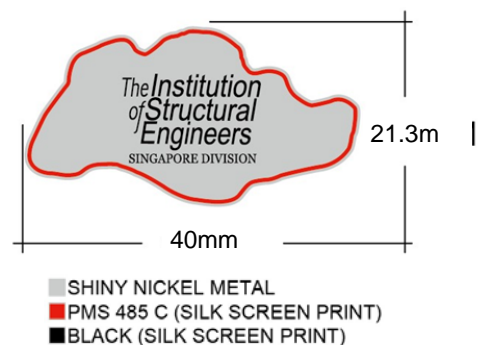
The awards were presented to the recipients by the IES President Er. Ho Siong Hin during the IStructE Singapore Division Members’ Night on Friday, 2 September 2011 at the M Hotel, Singapore.



From left to right: Andrew Palmer, Teh Poh Suan, D.C. Pham, IES President Ho Siong Hin, C.M. Wang, Lau Joo Ming and Winston Toh

IStructE Singapore Division Members’ Pin

The IES/IStructE Joint Committee has designed a lapel magnet pin for all members of the IStructE Singapore Division. Measuring about 21 mm by 40mm, the pin has the approximate shape of Singapore with rounded edges for safety reasons. These pins will be given out free of charge to members when they attend the division activities such as the members night or courses organized by the IES/IStructE Joint committee. Members are encouraged to wear these pins to IES and IStructE events so that we could promote our institution and strengthen our institution identity.



IStructE Structural Award 2011 Shortlisted Projects from Singapore: MBS Hotel & Skypark and The Helix

Marina Bay Sands

Conceived by Sheldon Adelson, Chairman and Chief Executive of Las Vegas Sands Corp, and designed by world-renowned architect Moshe Safdie, Marina Bay Sands is an exciting new development in the heart of Marina Bay and is dubbed one of Asia's most spectacular urban resorts.

The resort integrates a prestigious waterfront promenade with iconic retail, entertainment and hotel facilities, public spaces and breathtaking city views.

The three soaring-55-storey hotel towers with 2,500 guest rooms and suites is the biggest hotel in Singapore. Boasting the world's longest public cantilever, the SkyPark® rises 200m above ground and bridges across the three hotel towers, creating a garden city in the sky that offers magnificent views of the neighboring countries and Singapore skyline.



IStructE Singapore Structural

Awards 2010 Category: Award for Structures

Date of Completion: April 2010

Project Credits:

Client(s): Marina Bay Sands Pte Ltd

Architect(s): Moshe Safdie Associates in association with Aedas Pte Ltd

Contractor(s): SsangYong Engineering and Construction Co. Ltd. (Hotel)

JFE / Yong Nam JV (SkyPark®)

Structural Engineer: Arup

Other: Arup (Civil Engineering, Geotechnical Engineering, Transport Planning, Façade Engineering, Acoustics Consulting, Risk/Security Consulting, Building Modelling)

The Helix

Appointed in 2006 by the Urban Redevelopment Authority, the design consortium comprising global consulting engineers Arup, Australian architect The Cox Group, and Singapore-based Architects 61, emerged from 36 bids to win the rights to design the first pedestrian crossing at Marina Bay.

This defining project includes a pedestrian bridge (The Helix) and a vehicular bridge (Bayfront Bridge). Part of a 3.5km long waterfront promenade along Marina Bay, the 280m-long Helix is designed to curve to connect seamlessly with another pedestrian promenade. Its resemblance to DNA as a symbol of continuity, renewal, and everlasting abundance reflects Singapore's aspirations for Marina Bay.



The Helix is the first ever example of a double-helical structural scheme applied to a bridge. The creative use of duplex stainless steel and the efficient iterative design optimisation process resulted in an aesthetically lightweight and elegant structural form. The bridge measures 280m in length and weighs 1,700 tonnes.

IStructE Singapore Structural

Awards 2010 Category: Award for Infrastructures

Date of Completion: 9 April 2010

Project Credits:

Client(s): Urban Development Authority (URA)

Architect(s): Cox Architects with Architects 61 Pte Ltd

Contractor(s): Sato Kogyo & TTJ

Structural Engineer: Arup

Others: Arup (Civil Engineering, Lighting Design, Mechanical & Electrical Engineering, Maritime Engineering)