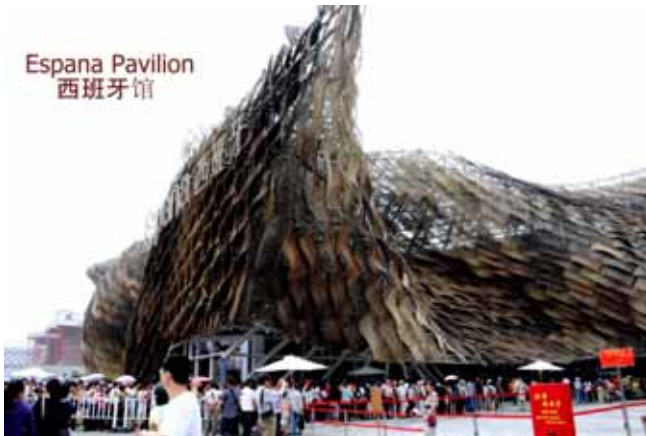
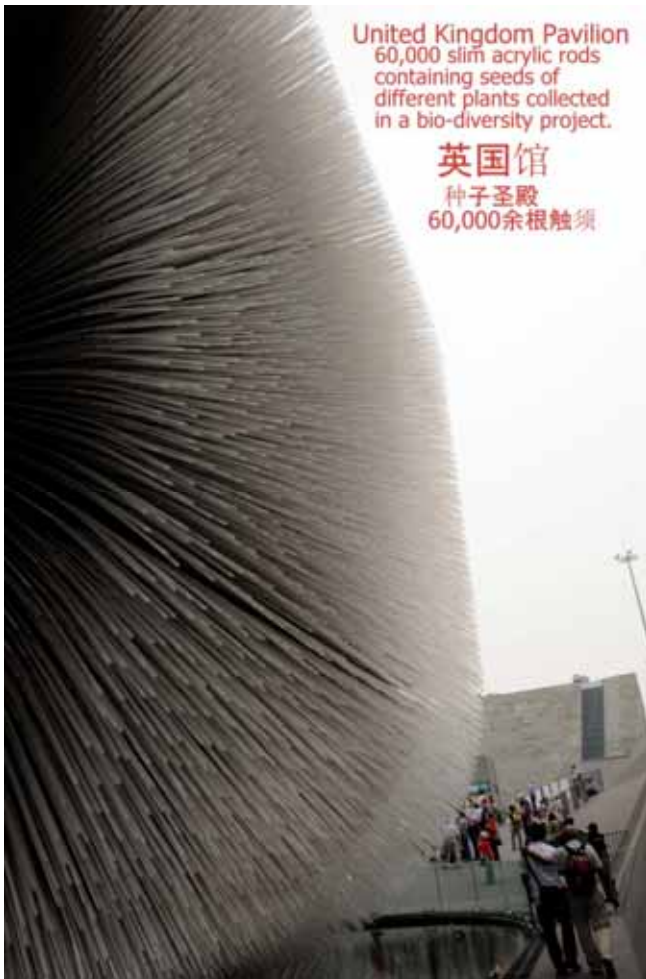


Shanghai EXPO Structures - Through the Lens of Er. Mah Guan Pang



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:

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News Flash

ASIA-PACIFIC FORUM ON STRUCTURAL EXCELLENCE AND SUSTAINABILITY

The IStructE China Group organized a terrific Asia-Pacific Forum on Structural Excellence and Sustainability in Shanghai, China. In the forum, recent achievements on structural sustainability and excellence worldwide were shared, which included innovative concepts, novel technologies, and new structural materials. Over 100 engineers, contractors, researchers, architects and professionals of mainland China, Hong Kong, Singapore, Malaysia, Australia, and UK participated in the forum.



Chairmen, Secretaries, Speakers and Representatives from Australia, China, Hong Kong, Malaysia, Singapore and UK at the Asia-Pacific Forum on Structural Sustainability and Excellence



Delegates toured the 2010 Shanghai EXPO site – the China Pavilion in the background is the top attraction, with its impressive design that blends ancient architecture with harmony and nature

The next IStructE Asia-Pacific forum will be held in Griffith University, Gold Coast, Australia on the 7th July 2011. For more information, please contact David Donnan (david.donnan@arup.com).

*KEYNOTE LECTURES BY SINGAPORE'S ENGINEERS
AT ASIA-PACIFIC FORUM 2010*

Er. Chew Keat Chuan of Building and Construction Authority (BCA), Ministry of National Development, presented a paper on Singapore's strategy towards sustainable construction. He pointed out that sustainable construction is critical to Singapore's national development as Singapore has little natural resources. Nearly all construction materials have to be imported and it is therefore vital to improve Singapore's efficiency on the use of natural resources. Since 2007, BCA together with Singapore's construction industry, strives to promote the adoption of sustainable construction materials and practices. The Sustainable Singapore Blueprint is the culmination of work undertaken by the Inter-Ministerial Committee on Sustainable Development (IMCSD). One of the key thrusts of the Blueprint is improving resource efficiency and achieving zero landfill. The building and construction sector, being one of the key drivers of Singapore's economy (19.8% growth in 2009), will be at forefront of this national effort. It is with this in mind that BCA, together with industry associations and major government agencies, formulated the Sustainable Construction Masterplan as part of the contribution to Singapore's sustainable development.

Er. Lau Joo Ming presented the plans for the Punggol Eco-Town and Eco-Modernisation developed by Singapore's Public Housing Authority, Housing and Development Board's Building Research Institute, as a model for the future development of next generation of eco-friendly homes and sustainable new towns in a dense urban environment setting in Singapore.



Er. Chew Keat Chuan



Er. Lau Joo Ming

*The Institution
of Structural
Engineers*

Conference on Structural Marvels

**13th – 14th December 2010
Marina Bay Sands®, Singapore**



About the Conference

The IES-IStructE Joint Committee is organizing this Conference on Structural Marvels to celebrate the innovativeness and achievements of Structural Engineers. The conference will feature an impressive list of structural marvels in Singapore as well as other parts of the world that will undoubtedly interest structural engineers, contractors and architects. These structures have been the talking point not only in their country of origin but also throughout the world. The conference will provide an opportunity for the delegates to present as well as to learn the latest developments in modeling, analysis, design and construction of surface, underground and offshore structures. There will be ample opportunities during coffee breaks, lunches and a dinner banquet for delegates to discuss the engineering problems and innovative solutions directly with the principal engineers/designers of these structures. For the 2-day conference, PEB has accredited 12 PDUs and CPD Accreditation (for SIA members) is 3 points

Registration Fee

The fee is inclusive of a copy of Conference proceedings (in colour), coffee break, lunch, reception, banquet, admission to the lectures and site visits.

IStructE and/or IES Members : S\$595.00

Non-IStructE or IES Members : S\$685.00

Full Time Students : S\$250.00

(Fee Inclusive of 7% GST)

Contact Person:

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Technical Talks

MARINA BAY SANDS HOTEL TOWERS - DESIGN AND CONSTRUCTION

On 7th July 2010, IES Multipurpose Hall was filled by a huge crowd of more than 200 engineers for the talk on Marina Bay Sands Hotel Towers - Design and Construction. The talk was delivered by Er. Wijaya Wong of Arup Singapore Pte Ltd.

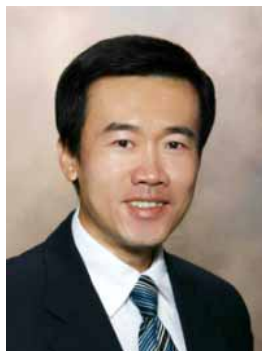
He informed that the design of Marina Bay Sands Integrated Resort hotel towers has two rows of shear walls in north-south elevation that split from level 23 to level 1 forming a high and grand atrium lobby. The row at the west is straight and the row at the east has a gradient. Each of the towers has its own unique geometry. The special design of the hotel towers poses an extremely challenging job for engineers. Er. Wijaya Wong addressed the techniques of post-tensioning design of the sloping walls during temporary construction stage as well as performance of the structure at final conditions. Other design considerations, analysis techniques, as well as construction methodologies of this special structure were also discussed in this talk.

Er Wijaya Wong is an associate with Arup Singapore Pte Ltd and is currently the team leader and the Qualified Person for Design (QP Design) of Hotel towers and basement in the Marina Bay Sands Integrated Resort Singapore. He is also a registered Professional Engineer in Singapore, and currently serves as Asst-Honorary Secretary in the IES-IStructE Joint Committee.

PROGRESSIVE COLLAPSE - LESSONS LEARNT FROM STRUCTURAL FAILURES BY PROF. RICHARD LIEW

Construction failures which may carry a considerable price tag for developers, consultants and contractor in terms of structural rehabilitation and loss of business or life could well lead to an expensive litigation process. Successful diagnosing of cause of failures, assessing its consequences, and presenting the findings convincingly are important to this process.

On April 28th 2010, Prof. Liew shared his experience on the investigation details of past structural failures that provide many lessons to construction professionals so that recurrence of these failures could be eliminated or minimised. He highlighted the methodology and tools for investigating construction failures, common deficiencies in steel structures to look out for and lessons learnt from structural failures. He added that incidents of failure or collapses can be pre-empted if the valuable experience and lessons from past cases are put into practice and not to take safety of buildings for granted.



Prof. Richard Liew



Marina Bay Sands Hotel



For scaling effect, the size of the 26th floor transfer truss of MBS Hotel is evident

Awards

IES-ISTRUCTE GOLD MEDAL AND BOOK PRIZE

Recipient of the IES/ISTRUCTE Gold Medal and Book Prize (National University of Singapore)

ISTRUCTE Singapore Division congratulates Miss Zhang Miao, winner of the 2010 IES-ISTRUCTE Medal and Book Prize for her distinguished performance in Structural Analysis, Structural Design & Materials and Design Project. Miss Zhang graduated with a First-Class Honours Degree in Civil Engineering from the National University of Singapore in July 2010.

Zhang Miao had also spent 3 semesters in a joint-degree programme at University of Melbourne, Australia where she performed very well in almost all her modules and was awarded Dean's Honours List in Bachelor of Engineering (Civil) and A.T. Danks Exhibition in Structural Engineering (*awarded to the student in the Department of Civil and Environmental Engineering with the highest aggregate mark in the analysis sections of the subjects Structural Engineering 1 and 2*).



Miss Zhang Miao

Recipient of the IES-ISTRUCTE Gold Medal and Book Prize (Nanyang Technological University)

ISTRUCTE Singapore Division congratulates Miss Trieska Yokhebed Wahyudi, recipient of the 2010 IES-ISTRUCTE Gold Medal and Book Prize. Trieska graduated with a First Class Honours Degree in Civil Engineering from Nanyang Technological University in July 2010. She was also the recipient of the following prizes:

- Lee Kuan Yew Gold Medal
- Continental Steel Award
- Continental Steel Book Prize
- Institution of Engineers Singapore Gold Medal
- Singapore Structural Steel Society Book Prize
- TUCSS Geotechnical Engineering Cash Award

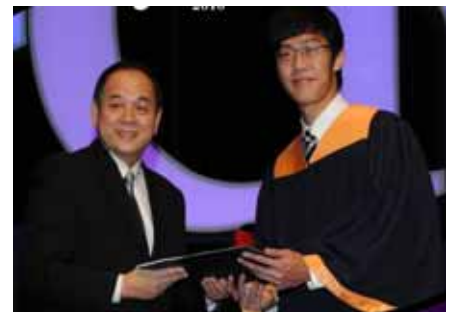
During her studies, Trieska was actively involved in several student clubs, such as Student Union, BP Mentoring Scheme, Civil and Environmental Engineering Club, Indonesian Student Christian Fellowship, and the Indonesian Freshmen Orientation Camp. She participated in student exchange programmes to Korea (Dong-A University) and Canada (University of Waterloo). Trieska was in the Dean's List for three consecutive years and was awarded the NTU President Research Scholarship in 2007. Congratulations!



Miss Trieska

Recipient of the IES-ISTRUCTE Silver Medal and Prize at Ngee Ann Polytechnic Graduation Ceremony

ISTRUCTE Singapore Division congratulates Mr Kiu Yan Ru, winner of the IES-ISTRUCTE Silver Medal and Prize 2010.



Yan Ru receiving the IES-ISTRUCTE Silver Medal and Prize from Mr Tan Kim Chwee, Director (Housing Administration), HDB, and Chairman of Ngee Ann Polytechnic's Building & Environment Division Advisory Committee

Announcement for ISTRUCTE Singapore Division Members' Night

The Institution
of Structural
Engineers

About The ISTRUCTE Members' Night

The IES-ISTRUCTE Joint Committee is organizing an ISTRUCTE members' night on 9 September 2010 @ Grand Copthorne Waterfront Hotel. This event provides a great opportunity for members of ISTRUCTE Singapore Division to get to know each other in a relaxing ambience and to receive an update on the ISTRUCTE Singapore Division activities from Joint Committee members. Also it is an opportunity for the committee to obtain valuable members' feedback on the activities and suggestions for future activities to meet members' needs. For more information, please contact Ms. Angela Loke (esplmh@nus.edu.sg).

MOTIVATING CIVIL ENGINEERING STUDENTS TO BE MORE CREATIVE

The Institution of Structural Engineers is pleased to support the 6th Inter-University Invitational Civil Engineering Competition (IUICEC), held at the National University of Singapore from 1-4 June 2010. The competition attracted 11 participating universities from five different countries. Initiated by Tsinghua University in 2000, IUICEC is a bi-annual event for undergraduate civil engineering students. The aim of the 6th Inter-University competition is to promote interest and creativity in structural and infrastructure engineering in civil engineering students and to foster strong friendship and exchanges of ideas among the young minds nurtured in different cultural backgrounds.

In this competition, each team comprises of three undergraduate students with at least one female student. Each team designs and fabricates a transformable bridge-like walkway comprising of two half-circles, which can be connected to form an S-shape or a circular shape bridge (see photo). This transformable bridge built using balsa woods is



Selected bridge models

subjected to both static and impact loading tests. The 6th IUICEC also includes a mini-geotechnical competition on "Soil Foundations under the Singapore Tower". After four days of intensive thinking, fabrication and testing, the team from Monash University won the First Prize for the competition. Teams from Tsinghua University and National University of Singapore shared the Second Prize, and teams from Hanyang University Erika Campus, Hanyang University Seoul Campus and Nanyang Technological University received the Third Prize. The team from the Hanyang University Seoul Campus also won the Best Architecture Design Award, while the teams from Nanyang Technological University and Tsinghua University came out on top in the mini-geotechnical competition.



S.WISE Gathering to Learn about "IStructE and How to become a Member"

Application to sit for the Chartered Membership Examination in April 2011 must reach the Institution in London on/ before 1st September 2010. In order to promote IStructE memberships, S.WISE organised a gathering for potential applicants. Held on 7 August 2010 at the Coffee Bean of Marina Bay Sands, the event attracted 15 engineers who have keen interest to become IStructE members. S.WISE members explained to them the various types of IStructE membership, options, benefits of becoming IStructE members and routes to GIStructE and MIStructE. There were also warm exchanges of working experiences (from the viewpoints of contractors and consultants) among the attendees. Er. Mah Guan Pang also attended the gathering to share his vast experience in engineering and, of course, to archive the event with his photo-taking skills.



Ms. Cong Zhengxia (4th from the left) and Er Mah Guan Pang (6th from the left) with attendees on the MBS Sky Park Roof



Engineers who are keen to apply for IStructE membership meeting at Coffee Bean in MBS

Prof C.M. Wang's Report on his Recent Trip to London

I attended the Council Meeting and the International Interest Group Meeting held on 29-30 July, 2010 in the HMS Belfast moored at the River Thames, London. It is interesting to have a meeting on a second world war battleship. Life on the battleship must be rather hard given the tight space constraint, the basic furniture and constant threat of being attacked.

Based on the discussions in the meetings, I summarize the points that I felt will be useful to our Singapore Division members.

Annual subscription fees for 2011 will be increased slightly, i.e. £348 for Fellow, £268 for Member and Associate, £174 for Associate-Member, £135 for Technician Member and £133 for Graduate and Companion. Note that members earning less than £15,000 per annum gets a 60% discount on their annual subscription fees.

Standing Committee on Structural Safety (SCOSS) is an independent committee supported by the Institution of Structural Engineers, Institution of Civil Engineers and the Health and Safety Executive. Its terms of reference are to (1) consider both current practice and likely development from the standpoint of safety, (2) be aware of trends and innovations in design, construction and maintenance from the standpoint of safety, (3) consider whether unacceptable risk exists or might arise in future, and if believed so, to give warning to relevant bodies, (4) consider whether R&D appears desirable from the standpoint of structural safety, and (5) disseminate the findings of the committee by a biennial report.

Structural Engineers have an important role to play in **climate change and sustainable construction**. Design has to be more optimal so that buildings have less embodied carbon.

Structural Engineers Association British Columbia (SEABC) conducts courses via internet in real time. Please look up SEABC website www.seabc.ca for these courses. Courses include Displacement-based Seismic Design to be conducted by M.J. Nigel Priestley on 17-18 September 2010 and Preparatory Courses for CM exams.

The Australian Division will be organising the **6th Asia Pacific Forum on Structural Engineering for Extreme Events** on Thursday 7 July 2011 at the Griffith University, Gold Coast, Queensland, Australia. 7-8 eminent speakers will be invited to present papers on the forum theme. For more information, please contact David Donnan (david.donnan@arup.com).

IStructE will be focusing on **India, China and United Arab Emirates** in their outreach activities. Dr Hirak Sen is helping in the India outreach, while Ms Zoe Zhou and Dr Shapour Mehrkar-Asl will be assisting in the China and UAE outreach activities. A newly formed Ontario Division is headed by Ms Vera Straka.

The membership committee will be further developing the marketing campaign for the introduction of the **mandatory reporting of CPD**.

Vice President YK Cheng pointed out the conundrum of having a gold standard, chartered membership examination for qualification to membership while desiring to expand the membership base. He suggested that qualifications of engineers in various countries be studied and recommendations made on what necessary top up measures are needed for these engineers to become members of the institution. The top up measures could be none for some countries, or perhaps a peer examination interview. This issue will be studied and debated further.

IStructE has 18 branches, 8 divisions and 1 group. There are 24,554 members as at 31 Dec 2009. 13547 are chartered members and 11007 are non chartered members. As at 31 December 2009, the Singapore Division has 352 members which include 27 fellow members. The Hong Kong Division is the largest with 2665 members.

The **Structural Engineer** will be published monthly instead of bimonthly as a result of downturn in advertising support due to recession.

IStructE has set up an online **book shop** (<http://shop.istructe.org/>) for members to purchase books, reports and design manuals on structural engineering. As we are in the era of the Eurocodes, members would be pleased to note that there are 4 Eurocode design manuals available in the book shop and members can purchase them at a discounted rate (<http://shop.istructe.org/topics/eurocodes.html>). Manuals for EC3 and EC7 will be published soon.



Organiser : IES-IStructE Joint Committee

Date : 24 & 25 November 2010 (Wednesday & Thursday) Venue : Novotel Clark Quay Singapore, River Valley Road

CPD : PDUs to be confirmed

Fees : \$888 (IES-IStructE Members), \$988 (Non-Members)

Fees are inclusive of 7% GST, a course book, lunches and light refreshments

About the Course

In March 2010 all fifty-seven Structural Design Standards published by BSI British Standards were withdrawn and replaced by the new suite of fifty-eight Structural Design Eurocodes and National Annexes. As part of this process EN 1994: *Design of Composite Steel and Concrete Structures* - (Eurocode 4), will replace BS5950 Parts 3.1, 3.2 and 4 and, whilst there are many similarities in principle between the two codes, there are some significant differences in both principle and detail. This course is aimed at civil and structural engineers seeking an understanding of the general rules, main features and changes contained in Eurocode 4 and the accompanying National Annex.

DAY 1 : DESIGN OF COMPOSITE STRUCTURES TO EN 1994 : Design of Composite Steel and Concrete Structures

In March 2010 all fifty-seven Structural Design Standards published by BSI British Standards were withdrawn and replaced by the new suite of fifty-eight Structural Design Eurocodes and National Annexes. These Eurocodes, developed over many years, will now become the definitive design standards across Europe and in many countries worldwide where British and other European Standards have been previously adopted. As part of this process EN 1994: *Design of Composite Steel and Concrete Structures* - (Eurocode 4), will replace BS5950 Parts 3.1, 3.2 and 4 and, whilst there are many similarities in principle between the two codes, there are some significant differences in both principle and detail.

This course is aimed at civil and structural engineers seeking an understanding of the general rules, main features and changes contained in Eurocode 4 and the accompanying National Annex. The course will cover the Eurocode system, basis of design, structural loading, material properties, design at the ultimate limit state and the serviceability limit state. Verification for fire resistance will be introduced. Worked examples with direct reference to Code Clauses will be used to illustrate the application of the code requirements.

DAY 2 : STRUCTURAL FIRE ENGINEERING DESIGN IN ACCORDANCE WITH THE EUROCODES

The introduction of the Structural Design Eurocodes and National Annexes in March 2010 presents some challenges for the structural engineer, but also some real opportunities. One of these concerns how the structure is designed to ensure stability in the event of a building fire. This has traditionally been achieved in a rather imprecise way, using prescriptive rules. These are often inflexible, offering little opportunity for the designer to do anything but specify some form of applied fire protection, and this can be very expensive. The new structural Eurocodes have radically changed this and include extensive details of alternative approaches which designers can adopt to demonstrate compliance with performance requirements for structural fire resistance.

This course is aimed at civil and structural engineers seeking an understanding of the basic principles and general rules concerning structural fire engineering design. No existing knowledge of fire engineering is required, and the course will outline alternative approaches which can be adopted. This will include an introduction to the threat to the structure from fire and how this has traditionally been addressed, explaining how the actions from the fire itself can be considered. This will be followed by details of the Eurocode approach for steel, composite, timber and concrete elements, and a brief introduction will also be given to more advanced approaches which can lead to even greater savings. Worked examples with direct reference to Code Clauses will be used to illustrate the application of the code requirements, in some cases using simple spreadsheets.

Course Lecturers



Roger Plank BSc, PhD, CEng, MICE,
FIStructE

Roger is a Chartered Structural Engineer and Senior Vice President of the Institution of Structural Engineers. He was, until recently, the Corus Professor of Architecture & Structural Engineering at the University of Sheffield, with over 30 years experience of teaching, research and consultancy, principally in steel construction. He currently works as an independent consultant, providing specialist advice in the fields of fire engineering, structural design and sustainable construction. He has been project manager for four EU funded projects developing teaching material for Eurocodes 3 and 4.



Buick Davison BEng, PhD, CEng, MICE

Buick has 30 years experience in teaching, research and consultancy and has worked at the University of Sheffield since 1993. His research interests are in the behaviour of steel framed structures and he has taught structural design to undergraduate and postgraduate students for many years. He has worked for the BSI on the composite chapter of the publication Extracts from the Structural Eurocodes for Students of Structural Design and has just completed editing a Eurocode version of the well-known Steel Designers' Manual.