ABC Waters Professionals
Elective Module EU3

Design, Construction and Maintenance of Constructed Wetlands
organized by IES

Date : 27 Jan 2014 (Monday)
Time : 8.30 am – 6.00 pm
Venue : 80 Toh Guan Road East, Singapore 608575 – To Be Confirmed
Fee : $300 - IES member, SIA member, SILA member
      $380 - Non-member
CPD : PDU / PDU (QECP) / CPD (BOA) – To Be Confirmed
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INTRODUCTION

Two-thirds of Singapore functions as local catchment areas. Under the Active, Beautiful, Clean Waters (ABC Waters) Programme, PUB has embarked on a journey to harness the full potential of our waters by integrating them with our environment. Over the past 2 to 3 years, other public agencies and private developers have also embraced the ABC Waters design that leads to improvement in water quality, enhanced biodiversity and new recreational space for people to get closer to water.

With more ABC Waters projects, there is a need to ensure that suitably qualified Engineers/Architects/Landscape Architects are on board to undertake the designs of such water features. IES is collaborating with PUB and other agencies to introduce the ABC Waters Professional Programme. The programme is aimed at building up the expertise in the area of ABC Waters design and increase the competitiveness of professionals in the Singapore market as well as within the region.

The objective of the Programme is to create awareness of ABC Waters design concept and its application in Singapore amongst professionals in the industry and to train professionals in the design, implementation and maintenance of ABC Waters Design features. Four core modules (CU1 to CU 4) and four elective modules (EU 1 to EU 4) are offered under the ABC Waters Professional programme. The Programme commenced on 16 Sep 2011 and to-date, a total of 12 core modules and 7 elective modules have been conducted.

Participants who complete all four core modules plus any two elective modules would be eligible to be registered as an ABC Waters Professional subject to full compliance with Registration Criteria. Registration Criteria will be announced at a later stage. Participants who complete any single module would receive certificate of attendance for the module completed.

It is envisaged that in the near term, the ABC Waters Professional certification may be a requirement for development proposals involving ABC Waters design features.

Supported by:

- PUB
- Housing & Development Board
- Land Transport Authority
- National Parks Board
- SIA
- SILA
EU3: Design, Construction and Maintenance of Constructed Wetlands - 24 Jan 2014
Durations: 8 hours

(8 hours include site visit) Mr Carsten M. Huttche, Prof Lloyd, Ms Quek Boon Shan & Dr Michelle Sim (course trainers)

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<td>0830-0930</td>
<td>Introduction to wetland treatment technology (history, benefits and uses)</td>
<td>Mr Carsten M. Huttche</td>
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<td>Design of treatment wetlands (design features and different types of wetland systems)</td>
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<td>Construction and operation of treatment wetlands</td>
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<td>0930-1030</td>
<td>Design Process of Constructed Wetland</td>
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<td>1045-1145</td>
<td>Plant selection and common species used in treatment wetlands</td>
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<td>Pollutant removal mechanisms in treatment wetlands</td>
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<td>Wetland monitoring and management</td>
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<td>1145-12.45</td>
<td>The use of wetland systems in Singapore</td>
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<td>Maintenance of ABC wetland projects</td>
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<td>1245-1345</td>
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Speaker Profile

Mr Carsten M. Huttche
Carsten is an experienced environmental and water resources specialist with 18 years professional experience. He has been working in Singapore since 1993, and has been based there for the past 16 years. He is currently working closely with Singapore Government agencies, providing specialist environmental design advice on applied bio-engineering solutions for ABC Watershed Projects. Carsten possesses full familiarity with Singapore ecological and environmental conditions and legislation, and how this relates to water resources management in the country. He has worked on a number of similar projects in South and South East Asia, China, and the Middle East, and has been responsible for leading, managing, and coordinating multi-disciplinary environmental and water resource projects.

His environmental management experience includes undertaking water quality assessments, contaminant source studies, biodiversity and land use assessments, and environmental risk and impact assessments. Recently, he has pioneered the development of GIS models for the mapping of environmental sensitive areas for for policy decision-making and planning. Lately, he has also been involved in the first climate change adaptation studies for International Financial Institutions such as the Asian Development Bank (ADB). He has a Masters Degree in Biology (major Tropical Ecology) from the Freie Universität Berlin (FU Berlin), one of Germany’s leading universities.

Carsten is the Founder and Director of three environmental businesses in Singapore and Indonesia: Environmental Professionals (Enviro Pro), 1998, environmental design and consultancy; Enviro Pro Green Innovations (EPGI) (S) Pte Ltd, 2009, bio-engineering supply and implementation; P.T. Enviro Pro Indonesia, 2007, environmental consultancy and capacity building. He held a Senior Adjunct Lecturer position at Singapore National University (NUS), School for Design and Environment, from 2008-2010. He conducted numerous teaching and speaking assignments since 2001.

Prof Lloyd Chua
Prof Chua is currently in the School of Civil and Environmental Engineering. He received his Bachelor degree in Civil Engineering from National University of Singapore, Master and Ph.D. degrees from Nanyang Technological University. He is a former winner of Emil Hilgard Hydraulic Prize, American Society of Civil Engineers (ASCE) (2005). He was awarded a fellowship for Post-doctoral research at LIB, Brandenburg Technical University (2000 – 2002) and a fellowship for Post-doctoral research at ISVA, Technical University of Denmark (1999 – 2000). He was awarded the Shaw Foundation Scholarship for undergraduate studies (1986 – 1989). His research interests include topics in urban hydrology, water quality, erosion and sediment transport, rainfall-runoff modeling and data driven modeling approaches in hydrologic engineering. He has published over 50 top quality international conference and journal papers. He has been invited as a referee and reviewer for a number of premier conferences and journals, including Journal of Hydraulic Engineering (ASCE), Journal of Hydrologic Engineering (ASCE), Hydrogeology Journal (AGU) and Journal of Hydrology.

Dr Michelle Sim
Dr Michelle Sim obtained her degrees in the field of aquatic sciences and completed her PhD on constructed wetlands in August 2007 from Malaysia. She joined PUB in April 2007 and she leads a team of engineers and biologists in monitoring and managing the water quality of waterways and reservoirs and providing technical solutions to improve water quality in waterways. She has 14 years of experience in water pollution control using constructed treatment wetlands and wetland monitoring. Dr Michelle Sim has involved in construction and monitoring of the 200 ha Putrajaya Wetland in Malaysia. In Singapore, she works closely with consultants on the design of wetland systems under the ABC Waters programme and her team is monitoring the performance of many wetland systems.

Ms Quek Boon Shan
Boon Shan obtained a Bachelor of Science from Duke University in North Carolina, USA, with a major in Biology and a minor in Environmental Science and Policy. She also graduated with a Master of Science in Environment and Development from University of Edinburgh, UK in 2010.

Since joining PUB in 2010, she has been involved in multiple constructed wetland projects. Her work includes monitoring and assessing the performance of different wetlands, providing technical advice on maintenance and implementing R&D studies on new systems. She also co-authored a journal paper on the Lorong Halus wetland system and a poster on floating wetlands presented at the IWA constructed wetland conference in Perth last year.
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Schedule for ABC Waters Professional Course in 2013:

**Core Module CU1: Understanding ABC Waters Design Guidelines and Certification – To Be Confirmed**
Duration: 8 hours including lectures, case studies and MCQ exam

**Competency Areas**
- Understand ABC Waters Management Strategies;
- An overview on planning, design and performance considerations for ABC Waters Management including:
  a. Catchment Elements
  b. Treatment Elements
  c. Collection & Storage Elements
- Understand Safety Considerations, Public Health & Maintenance
- Understand Multi-disciplinary nature of ABC Waters Management
- ABC Waters Certification Scheme

**Core Module CU2: Stormwater Quality Management -Planning and Designing ABC Waters Design features – To Be Confirmed**
Duration: 11 hours including lectures, case studies and MCQ exam

**Competency Areas**
- Appreciate ABC Waters Design
- Understand Storm Water Quality Parameters including the following:
  a. Suspended Solids
  b. Nutrients
  c. Litter
  d. Metals
- Formulate Stormwater Management Strategy
- Appreciate Sizing Stormwater Treatment Systems
- Introduction to Model for Urban Stormwater Improvement Conceptualization (MUSIC)
- Understand ABC Waters Design features including the following:
  a. Sedimentation Basins
  b. Swale/Buffer systems
  c. Bioretention Swales
  d. Bioretention Basins
  e. Cleansing biotopes
  f. Bio-engineering

**Core Module CU3: Design, Construction and Maintenance of Swales and Buffer Strips – To Be Confirmed**
Duration: 7 hours including lectures and MCQ Exam

**Competency Areas:**
- Understand design considerations for swales
- Able to produce suitable design for swales
- Able to provide construction advice for swales
- Knows the maintenance requirements for swales
- Case Example
Core Module CU4: Design, Construction and Maintenance of Bioretention Basins and Bioretention Swales – To Be Confirmed
Duration: 8 hours including lectures and MCQ Exam

Competency Areas:
- Understand design considerations for bioretention basins and bioretention swales
- Produce a suitable design for bioretention basins and bioretention swales
- Preparing and testing of soil media
- Sub-soil drainage system
- Plant selection
- Provide construction advice for bioretention basins and bioretention swales
- Appreciate the maintenance requirements for bioretention basins and bioretention swales
- Case example

Elective Module EU1: Design, Construction and Maintenance of Sedimentation Basins - To Be Confirmed
Duration: 8 hours including lectures and Case Studies and MCQ exam

Competency Areas:
- Understand design considerations for sedimentation basin
- Produce suitable design for sedimentation basin
- Apply construction advice for building sedimentation basin
- Appreciate the maintenance requirements for sedimentation basin
- Case example

Elective Module EU2: Design, Construction and Maintenance of Cleansing Biotopes and Bio-Engineering Techniques - To Be Confirmed
Duration: 8 hours including lectures and Case Studies and MCQ exam

Competency Areas:
- Understand design considerations for Cleansing Biotopes
- Able to produce suitable design for Cleansing Biotopes
- Able to provide construction advice for Cleansing Biotopes
- Knows the maintenance requirements for Cleansing Biotopes
- Case example of Cleansing Biotopes
- Understand design process for Bio-Engineering
- Understand design techniques for Bio-Engineering
- Provide construction advice for Bio-Engineering
- Appreciate the maintenance requirements for Bio-Engineering
- Case example of Bio-engineering

Elective Module EU3: Design, Construction and Maintenance of Constructed Wetlands – 27 Jan 2014
Duration: 8 hours including lectures and Case Studies and MCQ exam

Competency Areas:
- Understand design considerations for Constructed Wetlands
- Produce suitable design for Constructed Wetlands
- Plant selection
- Provide construction advice for Constructed Wetlands
- Appreciate the maintenance requirements for Constructed Wetlands
- Case example

Elective Module EU4: Slope Stability and Channel Design – To be confirmed
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Registration Form  

ABC WATERS PROFESSIONALS CORE MODULE EU3  
Design, Construction and Maintenance of Constructed Wetlands

Date: 27 Jan 2014 (Monday)  
Time: 8.30 am – 6.00 pm  
Venue: 80 Toh Guan Road East, Singapore 608575  
Fees*: $300.00 (IES/SIA/SILA Members) $380.00 (Non-Members)

Please register online/fax the completed form by 20 Jan 2014 before 3pm to:  
Venus Loh  
IES Academy 70 Bukit Tinggi Road (289758) Tel: 6463 9211 Fax: 6463 9468

Participant Details

Name: ___________________________  NRIC: ___________________________

Company: ___________________________  Designation: ___________________________

Address 1: ____________________________________________________________  
(For mailing of invoice and receipt)

Address 2: ____________________________________________________________  
(For mailing of Certificate)

Postal Code: ___________________________  Sex: ___________ Male / Female

Mobile No.: ___________________________  Fax: ___________________________

Email: ___________________________  
(For sending of confirmation email)

Please indicate:  
☐ IES/SIA/SILA members  IES/SIA/SILA M’ship No.: ______________ PEB/BOA No.: __________ (if applicable)  
☐ Non-members  ☐ Sponsored by company  ☐ Vegetarian

Contact Person Details (if different from participant)

Name: ___________________________  Designation: ___________________________

Tel: ___________________________  Fax: ___________________________

Email: ___________________________

Payment Details

Bank / Cheque No.: ______________  Amount ($) : __________

* All Fees are inclusive of 7% GST. Cheque should be made payable to: *IES*.

Acceptance of Terms and Conditions for Registrations of IES Academy’s Events

I agree to abide by the Terms and Conditions for Registration of IES Academy’s Events.

Name: ___________________________  Signature: ___________________________
TERMS & CONDITIONS COURSE REGISTRATION

Registration

Registration can be done either online or by faxing in the registration form.

Any registration, whether on-line or fax will be on a first-come-first-served basis and will only be confirmed upon receipt of full payment by The Institution of Engineers, Singapore (IES).

Email and phone registrations will not be accepted.

Closing Date & Payment

The closing date of the event will be 7 days prior to event commencement date. Cheques should be crossed ‘A/C payee only’ and made payable to ‘IES’, with the Date of event, Title of The Event and participants’ name indicated clearly on the back of the cheque, and post to:

IES Academy
70 Bukit Tinggi Road
Singapore 289758

Confirmation of Registration

Confirmation of registration will be given 7 days prior to the commencement date of event via email. If you do not receive the said confirmation email, you are required to contact IESA general admin immediately at 6463 9211 (office).

IESA reserves the right to allow only confirmed and paid registrants to attend the Event.

Withdrawals/Refunds of Fees

Notice of withdrawal must be given in writing to IESA. Policy on refund of course fee is as follows:

- FULL refund if we receive your written notice of withdrawal at least 7 days before the commencement of the Event.
- NO refund otherwise.

No show of participant would not be accepted as reason for withdrawal/refund.

Replacement is allowed but restricted to once only. Replacement will be allowed only if written notice is received by us at least 3 working days before the commencement of the event. However, when an IES member is replaced by a non-member, the participant has to pay the difference in the relevant fees.

Cancellation/Postponement

Changes in Venue, Dates, Time and Speakers for the Events can occur due to unforeseen circumstances. IESA reserves the full rights to cancel or postpone the Event under such circumstances without prior reasons. Every effort, however, will be made to inform the participants or contact person of any cancellation or postponement.

Fees will be refunded in FULL if any Event is cancelled by IESA.

Enquiries

For further enquiries, please contact IESA general office at Tel: 6463 9211.