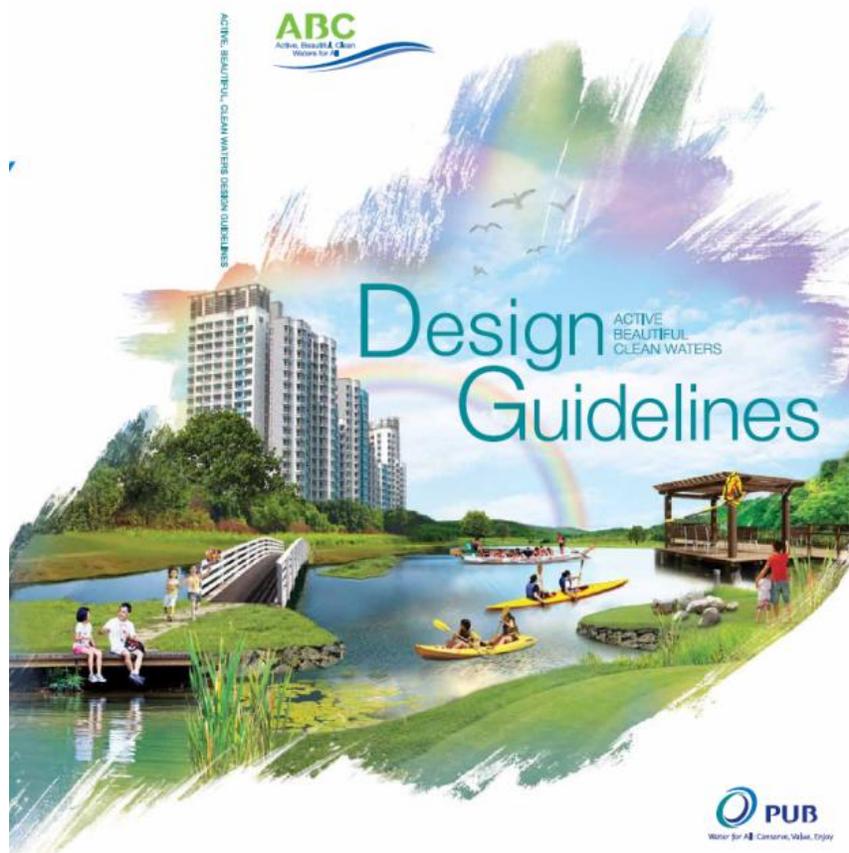




ABC Waters Professionals Core Module CU 2

Stormwater Quality Management – Planning and Designing ABC Waters Design Features

Organised by: IES



- Date: 4 – 5 August 2014 (Monday & Tuesday)
- Time: 8.30am – 6.00pm / 8.30am – 1.00pm
- Venue: PUB Waterhub
80 Toh Guan Road East Singapore 608575
- Course Fee: \$350 – IES member / SIA member / SILA member
\$450 – Non-member
- CPD: 10 PDU - confirmed / PDU (QECP) /CPD (BOA) – to be confirmed



ABC Waters Professionals Core Module CU 2

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.

To build up the expertise of industry professionals in ABC Waters design features, the ABC Waters Professionals Programme was launched in September 2011. Comprising four core modules and four elective modules, the programme covers the concept, design, implementation and maintenance of ABC Waters design features.

Participants who complete all four core modules plus any two elective modules, and meet the registration criteria of IES/SIA/SILA, would be eligible to be registered as an ABC Waters Professional. Details on the registration criteria can be found at the websites of IES, SIA and SILA. Participants who complete any single module would receive certificate of attendance for the module completed.

In line with the revisions to the Code of Practice on Surface Water Drainage, developers / owners shall engage an ABC Waters Professional to design, oversee the construction of, and develop a maintenance plan for the ABC Waters design features. The developer / owner shall submit the concept design and design calculations, endorsed by the ABC Waters Professional, to PUB as part of their Development Control (DC) submission.

On an annual basis, developers / owners shall also submit a certificate of inspection on ABC Waters Design features, endorsed by an ABC Waters Professional, if applicable. The certificate of inspection shall include a declaration on whether the features have been inspected, and are maintained satisfactorily and functioning well.

These new requirements on the endorsement of plans by ABC Waters Professionals will take effect from 1 January 2014 onwards.



Water for All: Conserve, Value, Enjoy





ABC Waters Professionals

Core Module CU 2

Course Outline for Core Module CU 2

1. Stormwater Quality Management – 4 hrs lecture by Prof Ong Say Leong

- Stormwater Quality
 - Urban Runoff
 - Runoff Quality Characterisation
- Stormwater Quality Management
 - Brief Overview
 - Storm Water BMPs
 - Performance Characteristics

2. Hydrology (Stormwater Quantity Aspects) and MUSIC – 2 hrs lecture by Dr Vivien P Chua

- Stormwater Quality
 - Rainfall analysis
 - Sea-level analysis
 - Runoff estimation
 - Hydraulic design of drainage
- Music
 - Interface, modelling approach, output
 - Applications

3. Constructed Wetlands – 1 hr lecture by Dr Michelle Sim

- Introduction to wetland treatment technology (history, benefits and uses)
- Design of treatment wetlands (design features and different types of wetland systems)
- Pollutant removal mechanisms and the role of wetland plants
- Plant selection and common species used in treatment wetlands
- Wetland monitoring, management and maintenance (wetland performance, plant management, water quality monitoring)
- The use of wetland systems in Singapore

4. Vegetated swale/bio-retention swale/rain garden/sediment basin – 2 hrs lecture by Dr Stephen Tan

- Sedimentation Basins
- Swale/Buffer systems
- Bio-retention Swales
- Bio-retention Basins

5. Definition, background, sense, use, function, technical details, construction method and maintenance – 1 hr lecture by Mr Yau Wing Ken / Ms He Qihui

- Cleansing biotopes
- Bio-engineering

6. MCQ Exams – 1 hr



ABC Waters Professionals

Core Module CU 2

Speaker's Profile

Prof Ong Say Leong

Professor Ong Say Leong graduated from the University of Singapore with BEng (Civil Engrg) in 1979. He obtained his MEng (Biochemical Engrg) from the University of Western Ontario in 1980 and a PhD (Civil Engrg) from the University of Toronto in 1983. His research interests lie in the study of membrane technology for water and wastewater treatment, water quality enhancement, water reclamation and reuse, modelling of water quality enhancement systems, bio-treatment processes and sustainable urban water resources management.

Professor Ong is a registered professional engineer and has been involved in consulting jobs on water and wastewater treatment system and water quality management. He is also active in the professional circuit and has been serving in several environmental engineering committees and editorial boards for international journals in the area of water environment. Professor Ong is a Fellow of The Institution of Engineers, Singapore and a Fellow of the International Water Association. In addition, he is a Diplomat of the American Academy of Water Resources Engineers (D.WRE) and a Board Certified Member of The American Academy of Environmental Engineers (BCEEM). Professor Ong is currently the Deputy Director (Technology) for the NUS Environmental Research Institute (NERI).

Dr Vivien P Chua

Dr Vivien Chua joined the Department of Civil and Environmental Engineering at the National University of Singapore as an assistant professor in 2011. Dr Chua received her PhD and M.S. degrees from Stanford University in 2012 and 2008 respectively. She obtained her B.S. degree (Highest Honors) from Georgia Institute of Technology in 2005.

Dr Chua's research interests lie in the study of processes that influence the dynamics of the coastal ocean, rivers, lakes and estuaries. Her projects include simulating circulation and transport in coastal oceans and estuaries, studying flow and transport in vegetation systems and analysing secular trends, spatial and seasonal variability in sea levels. Most of her research thus far focuses on the development and application of numerical models and high performance computational techniques to study surface water flows. Her work strongly relies on combining advanced numerical models with observations, and then analysing that model analytically and computationally to understand current conditions and to predict future behaviour in the face of climate change.

Dr Michelle Sim

Dr Michelle Sim obtained her degrees in the field of aquatic sciences and completed her PhD on constructed wetland 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.

Dr Stephen Tan Boon Kean

Dr Tan is a hydrology, hydraulic and water quality specialist. Some of his ongoing and completed projects related to implementation of ABC Waters Design Features include Lower Seletar Family Bay (Singapore), Sengkang Floating Island (Singapore), Lorong Halus Wetland (Singapore), Garden by the Bay (Singapore), MacRitchie Reservoir Phase 2 (Singapore), Punggol-Serangoon Reservoir Scheme (Singapore), Eco-Tourism Park (Vietnam), Integrated Water Management for Pearlhill Development (Qingdao, China), Pilot Train Garden and Bio-retention Swales in Brunei Darussalam, Redevelopment of Sungei Buloh Wetland Reserve (Singapore). Dr Tan obtained his PhD from the Nanyang University of Singapore.



ABC Waters Professionals Core Module CU 2

Mr Yau Wing Ken

Mr Yau graduated with a Bachelor in Chemical Engineering from the National University of Singapore and is now working in the Catchment & Waterways Department of PUB. He was part of the ABC Waters Programme Branch in 2009 – 2014 where he was involved in the implementation of many prominent ABC Waters projects such as Alexandra Canal, Rochor Canal and Kally River@Bishan-Ang Mo Kio Park, as well as the master planning consultancy study led by URA for the WSUD concept to public agencies, professionals and developers, and has worked on the ABC Waters Certification scheme. He is currently involved in the implementation of the ABC Waters pilot precinct at Waterway Ridges (Punggol East C39) and is part of the Drainage Operations Division.



ABC Waters Professionals

Core Module CU 2

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 – 4 to 5 August 2014

Duration: 12 hours including lectures, case studies and MCQ exam

Competency Areas

- Stormwater Quality
 - Urban Runoff
 - Runoff Quality Characterization
- Stormwater Quality Management
 - Brief Overview
 - Storm Water BMPs
 - Performance Characteristics
- Introduction to Model for Urban Stormwater Improvement Conceptualization (MUSIC)
 - Rainfall analysis
 - Sea-level analysis
 - Runoff estimation
 - Hydraulic design of drainage
 - Interface, modeling approach, output
 - Applications
- 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
 - g. Constructed Wetlands

Core Module CU3: Design, Construction and Maintenance of Swales and Buffer Strips – to be confirmed

Duration: 8 hours including lectures, case studies 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



ABC Waters Professionals Core Module CU 2

Core Module CU4: Design, Construction and Maintenance of Bioretention Basins and Bioretention Swales – 31 July 2014

Duration: 8 hours including lectures, case studies 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- 10 September 2014

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: - to be confirmed

Design, Construction and Maintenance of Cleansing Biotopes

Bio-Engineering: Design Processes and Implementation Techniques

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

Competency Areas:

- 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

Elective Module EU3: Design, Construction and Maintenance of Constructed Wetlands – to be confirmed

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



ABC Waters Professionals Core Module CU 2

Registration Form

ABC WATERS PROFESSIONALS CORE MODULE CU2

“Stormwater Quality Management -- Planning and Designing ABC Waters Design features”

Date : 4-5 August 2014
Time : 8.30 am – 6.00 pm (Mon) / 8.30am to 1pm (Tue)
Venue : 80 Toh Guan Road East Singapore 608575
Fees : \$350.00 (IES/SIA/SILA Members) \$450.00 (Non-Members)

Please register online/fax the completed form **by 25 July 2014 before 12 noon** to:

Lillian Seow
IES Academy
70 Bukit Tinggi Road S(289758)
Tel: 64639211 Fax: 6463 9468

Participant Details

Name: _____ NRIC: _____

Company: _____ Designation: _____

Address: _____
(For mailing of invoice and receipt)

Address: _____
(For mailing of certificate)

Postal: _____ Sex: Female / Male Mobile: _____ Fax: _____

Email: _____

Please indicate: IES/SIA/SILA members PEB/BOA No.: _____ Sponsored by company
M'br No: _____
 Non-members 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: _____



ABC Waters Professionals Core Module CU 2

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.