SWaM 2026

NATIONAL CONFERENCE ON STORMWATER MANAGEMENT

Inspired by Nature, Engineered for Resilience

PRE-CONFERENCE B

Engineering Resilience: Assisting Nature's Approach to Riverbank Repairs and Protection

Cheong Hon Loong

Ir. Leong Kwok Wing

1 SEPTEMBER 2026

SUNWAY PUTRA HOTEL, KUALA LUMPUR

8.00 AM – 5.00 PM

COURSE SUMMARY

This one-day course combines innovative riverbank restoration strategies with advanced field technologies. Through real-world case studies, participants will explore biotechnical engineering, re-directive techniques, and Nature-based Solutions (NbS) as sustainable alternatives to conventional hard engineering. The program also highlights Best Field Practices in UAV deployment and AI-assisted analysis for smart surveying, planning, monitoring, and project management.

OBJECTIVES

- Understand natural river processes and their role in cost-effective bank stabilization.
- Examine the limitations of conventional hard-armored river engineering and associated downstream impacts.
- Compare re-directive and resistive approaches to riverbank protection and restoration.
- Explore biotechnical engineering techniques adapted from temperate regions for tropical Malaysian conditions.
- Review successful river rehabilitation and flow-management case studies from real projects.
- Assess challenges and opportunities in converting hard-engineered river channels to vegetated, nature-based systems.

LEARNING OUTCOMES

- Fundamentals processes driving riverbank scouring and instability shared.
- Explore the basic principles behind re-directive, resistive and natural riverbank restoration approaches
- Gain natural insights on the selection of appropriate biotechnical techniques for various site conditions
- Introduction to UAV & Field Applications guided by an experienced licensed pilot.
- Answers to Questions that you need to ask the – Who, When, Why, Where, Which & How critical questions in planning evaluations for a successful project outcome
- Integration of overall techniques with basic consideration of AI-enhanced decision-making

CONTENTS

Module 1: Engineering Resilience and Riverbank Dynamics.

i) Why Riverbanks Fail
ii) Concept of Engineering Resilience

Module 2: From Hard Engineering to Green Solutions

Natural Solutions – Re-Directive Flow Methods.

Module 3: Nature-Based Riverbank Protection Techniques

Bio-Technical Engineering Applications

Module 4: Introduction to UAV & Field Applications

The Who, When, Why, Where, Which & How Applications.

Module 5: Integration and Selection of techniques & analysis, assisted by AI.

HRD CORP CLAIMABLE

CPD/PDH PROVIDED

For Inquiries

010-6549675 (Syaza)
017-2229675 (Hasanah)
mso.conference@gmail.com
https://swam2026.stormwater.org.my/

SWaM 2026
NATIONAL CONFERENCE ON STORMWATER MANAGEMENT
Inspired by Nature, Engineered for Resilience

Pre - Conference B
Tentative Program

1 SEPTEMBER 2026	08:00 AM - 05:00 PM	SUNWAY PUTRA HOTEL, KUALA LUMPUR

TIME	SESSION	DETAILS
07:30 – 08:30 AM	Registration & Welcome Drink	Participant registration &networking
08:30 – 10:35 AM	**Module 1: Ir. Leong Kwok Wing** Engineering Resilience and Riverbank Dynamics	Fundamentals of River Processes and Causes of Bank Instability: • Why Riverbanks Fail • The Concept of Engineering Resilience
	Module 2: Ir. Leong Kwok Wing From Hard Engineering to Green Solutions	Evolution of River Restoration Practices enhancing resilience: • Natural Solutions - Introduction to various Re Directive flow methods • Deflectors and flow training structures • Sediment deposition and natural bank rebuilding – Sg Pedu, Kedah
10.35 - 10.55 AM	Morning Break	
10.55 AM -1.00 PM	**Module 3: Ir. Leong Kwok Wing** Nature- Based Riverbank Protection Techniques	Bio-Technical Engineering Applications, adapted to tropical environments • Integrating engineering, landscape, aesthetic and environmental objectives • Live staking and vegetative geosynthetic reinforcement • Brush layering, fascines modified with fiber logs Case Studies: MSMA Green Riverbank Restoration projects, Malaysia, Tuen Mun Riverbank Aesthetics Trial Panels over hard riverbank surface, Hong Kong, Flexible, Fast, Economical & Durable Flow Channel over Landfill Cap, Hong Kong
1.00 - 2.15 PM	Lunch	
2.15 - 4.30 PM	**Module 4**: **Cheong Hon Loong** Introduction to UAV & Field Applications	Questions to Ask: Who, When, Why, Where, Which & How Applications for a successful project: • Actual field examples shared for Site Planning, Before & During Grading, During & Post Construction, • Explain the Do's & Don'ts, shared by a licensed and experienced UAV pilot.
	Module 5: Cheong Hon Loong Integration and Selection of techniques & analysis, assisted by AI	Deployment of latest (BAT) for project survey, planning, cost estimates, monitoring & surveillance. • Program may include a "hands-on & quick demo", when time permits, • Wrap-Up & Key Takeaways, Q&A and Closing Remarks.
4.30 - 5.00 PM	Afternoon Break	