Organised by Geotechnical Engineering Technical Division &
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HALF DAY SEMINAR ON

SUSTAINABLE GEOTECHNICAL ENGINEERING "REINFORCE. PROTECT. DETECT."

SPEAKERS:

Ir. Saiffuddin bin Sheafi

Ir. Mohd Rizal bin Ahmad

21 OCTOBER 2025, TUESDAY
8:30 AM - 1:00 PM
MALAKOFF AUDITORIUM, WISMA IEM , PETALING JAYA

BEM Approved CPD: 4
Ref. No.: IEM25/HQ/472/S

Registration fee (Subject to 8% SST)

GRADE	FEE (VIA IEM WEBSITE)	FEE / HRDC (THROUGH EMAIL)
Student	COMPLIMENTARY	
IEM Member / HRDC for IEM Member	RM 50	RM 75
Non-IEM Member / HRDC for Non-IEM Member	RM 100	RM 125

JOIN NOW

APPROVED DURATION:
16/09/2025 - 19/09/2026
HRD CORP SERIAL NO:
10001600575

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SYNOPSIS

Session 1 – Embankments on weak Ground

Covers design of embankments with reinforced soil foundations on soft or problematic ground in accordance with BS 8006 and international practice. Topics include:

- Piled embankments: load transfer mechanisms, arching effect, and reinforcement tension design.
- Basal reinforcement: settlement control, sliding stability, and global stability checks.
- Cavity/void spanning: tensioned membrane analysis, serviceability strain limits, and design considerations for collapsible or karstic ground.
- Load transfer platforms (working platforms): bearing capacity for plant loads, reinforcement for load distribution, and survivability requirements.
- Current practice: staged construction, observational methods, adoption of multiple geogrid layers, and emphasis on serviceability performance.

Exercise: Worked examples covering all four applications:

- Piled embankment: calculate arching ratio, load transfer efficiency, and reinforcement tension using BS 8006 methods.
- Basal reinforcement: check differential settlement, calculate required tensile strength, and verify sliding stability.
- Cavity/void spanning: apply tensioned membrane approach to a defined void span, calculate reinforcement strain and deformation.
- Load transfer platform: size platform thickness for a given plant loading (100–150 kN), check bearing and punching resistance, and verify reinforcement survivability.

Outcome: Participants will be able to perform calculations for piled embankments, basal reinforcement, cavity/void bridging, and load transfer platforms in accordance with BS 8006. They will understand how to derive reinforcement forces, evaluate serviceability limits, and apply observational methods in practice.

Session 2 – Reinforced Soil Structures

Covers the design of reinforced soil structures (slopes and retaining walls) in accordance with BS 8006 and current practice. Topics include:

- Internal stability: checks for tensile rupture, pullout resistance, and connection strength.
- External stability: sliding, overturning, and bearing capacity of the overall system.
- Global stability: assessment of compound failure surfaces.
- Durability considerations: creep, installation damage, chemical/biological resistance, and long-term design strength.
- Current practice: adoption of modular vegetated facings, hybrid systems with primary and secondary reinforcement, and performance-based design for 120-year durability.

Exercise: Worked examples of reinforced soil walls at 6 m and 24 m height, covering internal stability, pullout, and external stability checks step by step.

Outcome: Participants will develop practical understanding of reinforced soil slope and wall design, be able to apply BS 8006 design checks (internal, external, and global stability), and appreciate current industry practices including durability and sustainable facing systems.

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SYNOPSIS

Session 3 – Early Warning and Monitoring System

Covers the application of early warning and monitoring for geotechnical and hydraulic infrastructure using the IoT based system. Topics include:

- System concept: IoT-enabled sensors integrated with cloud platforms for real-time monitoring and alerts.
- Sensor applications: Deployment on slopes, rockfall protection, bridge, and hydraulic structures.
- Connectivity & data flow: LoRaWAN, GSM, or satellite networks transmitting continuous field data.
- Integration with agencies: Alignment with JKR, JPS, NADMA, and MKN protocols for coordinated response.
- Current practice: Combining observational methods with predictive analytics to ensure serviceability and safety rather than reliance on strength checks alone.

Exercise: Case demonstration of HelloMAC on a slope and rockfall protection project. Participants review data, identify instruments to be used, and simulate an early warning activation workflow.
Outcomes: Participants will gain practical understanding of IoT-based monitoring, learn to interpret real-time data, and apply early warning insights to improve infrastructure safety and resilience.

Session 4 – Erosion control design

Covers design of erosion control measures for natural slopes and watercourses in accordance with international guidelines and test standards (ASTM D6459, ASTM D6460, ISO 18228). Topics include:

- Slope erosion: mechanisms of rainfall-induced erosion, absorption of raindrop impact, and methods to reduce soil particle detachment.
- Channel erosion: mechanisms of stormwater-induced scour, approaches to neutralize hydraulic forces, and assessment criteria for performance.
- Design methodology: application of the Revised Universal Soil Loss Equation (RUSLE) to estimate soil loss and evaluate erosion risk.
- Soil and rainfall factors: consideration of rainfall erosivity (R), soil erodibility (K), slope length and steepness (LS), and cover/management practices (C, P, M).
- Anchorage design: determination of geomat pin spacing as a function of slope geometry, inclination, and expected installation loads to ensure survivability and serviceability.
- Current practice: selection of erosion control measures based on soil characteristics, rainfall intensity, slope geometry, and long-term vegetation establishment.

Exercise: Worked example on a slope section subject to rainfall erosion. Participants estimate soil loss with and without protection, evaluate effect of slope length and steepness, determine suitable cover factors, and calculate pin spacing requirements for geomat anchorage
Outcome: Participants can (i) explain slope/channel erosion mechanisms and applicable standards, (ii) apply RUSLE to size protection and justify cover factors, and (iii) set preliminary pin-spacing/anchorage layouts from slope geometry and installation loads, with assumptions documented for revi

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PROGRAMME

Time	Description	Speaker
8:30am – 8:50am	Registration & Light Refreshment	
8:50am – 9:00am	Welcoming Address	
9:00am – 10:00am	Session 1 – Embankments on weak Ground	Ir. Mohd Rizal bin Ahmad
10:00am - 10:15am	Morning Tea Break	
10:15am – 11:15am	Session 2 – Reinforced Soil Structures	Ir. Mohd Rizal bin Ahmad
11:15am – 12:00pm	Session 3 – Early Warning and Monitoring System	Ir. Saiffuddin bin Sheafi
12:00pm – 12:45pm	Session 4 – Erosion control design	Ir. Saiffuddin bin Sheafi
12:45pm - 1:15pm	Q&A Session	
1:15pm	Lunch	

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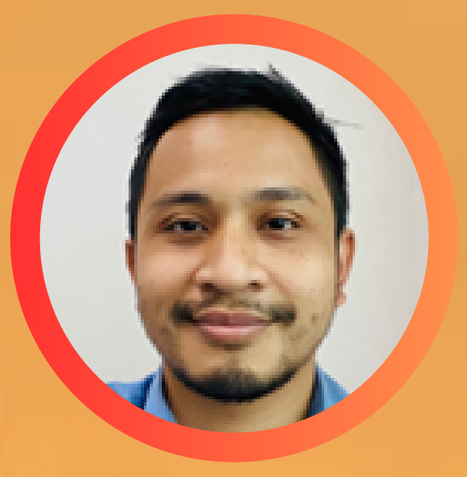
SPEAKERS BIODATA



Ir. Saiffuddin bin Sheafi

Ir. Saiffuddin bin Sheafi, graduated from University Teknology Malaysia in 2006 with a Bachelor of Civil Engineering. He is an engineering professional with over 18 years of experience in consultancy, contracting, and manufacturing within the hydropower, mining, and water resources sectors. Currently serving as the Technical Manager at Maccaferri Malaysia, he has played a pivotal role in delivering engineering solutions for both local and international projects, often in highly challenging topographical and climatic conditions.

Throughout his career, Ir. Saiffuddin has been actively involved in major infrastructure and resource projects, specializing in the design, construction, and management of tailings and water dams, tunnels and underground structures, mine waste dumps, rock slope stability, dam safety, flood mitigation, and risk assessments. His deep technical knowledge, coupled with a strategic approach to engineering solutions, ensures sustainable and innovative project outcomes. Committed to excellence in geotechnical and structural engineering, he continues to contribute to the advancement of the industry through his leadership and expertise.

Ir. Mohd Rizal bin Ahmad

Ir. Mohd Rizal bin Ahmad is a geotechnical engineering professional with over 15 years of experience spanning consultancy, specialist contracting, and advanced geosynthetic applications across Malaysia and Southeast Asia. Graduated from Selangor University with Bachelor's Degree In Civil Engineering, he currently serves as the Business Development Manager at Maccaferri Malaysia, where he plays a pivotal role in promoting sustainable, high-performance systems such as TerraMesh™ in major infrastructure and slope stabilization projects.

Ir. Rizal's core expertise includes ground improvement, reinforced soil structures, basal reinforcement, and the integration of geosynthetics in challenging soil environments. He has contributed to high-impact projects throughout Malaysia, Indonesia, Vietnam, and the Philippines — including airport expansions, urban highway reinforced soil walls, port reclamations, power plant foundations, and critical slope protection works.

A strong advocate for innovation in geotechnical engineering, Ir. Rizal promotes the adoption of automation and digital technologies, particularly IoT-based early warning systems for real-time monitoring and predictive slope failure detection.

He has delivered invited lectures at international conferences and is committed to advancing industry standards through knowledge-sharing, integrated design approaches, and sustainable engineering practices.

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REGISTRATION FORM

No	Name (s)	M'Ship Number	IC No.	Fee (RM)
			SUB TOTAL	
			ADD SST @8%	
			TOTAL PAYABLE	

***Fees MUST be fully paid BEFORE the CLOSING DATE. Seats could only be confirmed upon payment. Enclosed herewith a crossed cheque No: _____for the sum of RM _____ issued in favour of "The Institution of Engineers, Malaysia" and crossed 'A/C payee only'. I/We understand that the fee is not refundable if I/We withdraw after my/our application is accepted by the Organising Committee as stated in the cancellation term. If I/We fail to attend the seminar, the paid registration fee will not be refunded.**

Name_____ Designation: _____
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_____ _____
Signature & Stamp Date

Kindly email the registration form to sitiaisyah@iem.org.my

IMPORTANT:

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STRICTLY, secretariat will not entertain shall you wish to CHANGE TO HRDC AFTER PAID THROUGH THE IEM PORTAL.

Your cooperation is highly appreciated.

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