The Institution of Engineers, Malaysia

WEBINAR TALK ON WOMEN IN ENGINEERING INNOVATIONS FOR GRAPHENE MODIFIED CONCRETE AND FASTENERS IN LOW-CARBON CONCRETE

Organised By : Civil & Structural Engineering Technical Division, IEM

BEM APPROVED CPD HOURS : 2
REF NO. : Applying

Dec, 16th

2.00pm - 4.00pm

Via Online Zoom

Speakers

Dr Meini Su

Dr Jessey Lee

REGISTRATION FEES
IEM Students: Free
IEM Members: RM15 (Online)
Non-IEM Members: RM70

Our Website
www.myiem.org.my

Programme

Time	Session	Speakers and Moderator
2:00 – 2:05 PM	Welcome Remarks & Introduction of Speaker 1	Assoc. Prof. Dr Daniel Looi (IEM CSETD / Sunway University)
2:05 – 2:50 PM	Talk 1: Graphene Modified Fibre Reinforced Cementitious Matrix (Gr-FRCM) for ICCP-SS Intervention Method	Reader Dr Meini Su (University of Manchester, UK)
2:50 – 3:00 PM	Q&A Session for Talk 1	Moderated by Assoc. Prof. Dr Daniel Looi
3.00 – 3.05 PM	Introduction of Speaker 2	Assoc. Prof. Dr Daniel Looi
3:05 – 3:50 PM	Talk 2: Decarbonising Concrete – How Do Fasteners Perform in Low-Carbon Concrete?	Assoc. Prof. Dr Jessey Lee (Swinburne University of Technology, Australia)
3:50 – 4:00 PM	Q&A Session for Talk 2	Moderated by Assoc. Prof. Dr Daniel Looi
4:00 – 4:05 PM	Photo Session and Closing	Assoc. Prof. Dr Daniel Looi

Synopsis 1:
Reinforced concrete (RC) structures are susceptible to steel corrosion during their service life, caused by various factors including exposure to marine environments, use of sea-sand in concrete, or use of de-icing salts in winter. The problem of corrosion of RC structures can be tackled by either reducing corrosion, or structural strengthening or both. Current practices typically involve tackling one of the two problems. Recently, a novel dual intervention and strengthening method, known as ICCP-SS has gained popularity. This method combines Impressed Current Cathodic Protection (ICCP) as the intervention method with external structural strengthening (SS), using fabric-reinforced composite (FRCM) as both the anode for ICCP and the loadbearing material for SS. However, concerns have been raised regarding the long-term performance of the FRCM composites in ICCP-SS intervention systems. During ICCP, calcium leaching was observed at the carbon fibre/cementitious matrix interface which weakens the bonding between the fibre mesh and cementitious matrix, leading to debonding failure of the structure and unacceptably high voltage for the whole ICCP system. This research focuses on the effects of incorporating graphene nanoplatelets into the ICCP-SS system to improve the bonding at the fibre–matrix interface and prolong the service life of the repaired RC structures.

Synopsis 2:
As the construction industry races toward net-zero targets, low-carbon concretes have emerged as a critical pathway for reducing embodied emissions. However, the shift from traditional Portland cement to alternative binders such as fly ash, slag and geopolymer concrete with the introduction of steel fibres in concrete introduces changes in material properties that challenge long-standing current state-of-the-art design assumptions in EN 1992-4. This presentation explores how post-installed and cast-in fasteners perform in innovative concretes. Drawing on experimental data and literature from recent studies, performance of fastenings in steel fibre reinforced concrete and one-part ambient cured geopolymer concrete mixes under different loading conditions is discussed. Findings indicate that the current state of the art formula for anchorage design may be modified/ adjusted to better predict the performance of fastenings. By integrating sustainability considerations with structural reliability, this work aims to provoke discussion on how anchorage design and testing frameworks must evolve to ensure safety and performance in a decarbonised construction future.

Speakers Biodata

Dr. Jessey Lee is an Associate Professor and Deputy Chair at the Department of Civil and Construction Engineering, Swinburne University of Technology. With over a decade of experience spanning academia and industry, she specializes in fastenings in concrete, timber, and steel, modular construction, and reliability studies. Dr. Lee has successfully led more than 40 research projects for national and international clients, including manufacturers, consultants, and government bodies. Her career includes roles as Senior Lecturer, AEFAC Training Manager, and Senior Structural Engineer, reflecting a strong blend of technical expertise and leadership in engineering innovation.

Dr. Meini Su is a Reader in Structural Engineering at The University of Manchester, UK. She holds a PhD in Civil Engineering from Imperial College London and The University of Hong Kong, with a specialization in plastic design of aluminium alloy structures. Dr. Su is a Chartered Engineer (IStructE & ICE) and a Fellow of the Higher Education Academy. Her academic journey spans roles from Lecturer to Reader, with international experience in China and Hong Kong. She also leads the Safer Infrastructure Theme at the Thomas Ashton Institute and serves as a Visiting Scholar in Hong Kong. Dr. Su is actively involved in professional bodies including EPSRC, FIB, RILEM, and the Concrete Society, contributing to both research and industry advancement.