IEM
The Institution of Engineers, Malaysia

Webinar Talk on

"Promulgation of the First Geopolymer Concrete House (Super-structure) Constructed at University Malaya Campus for Bus Drivers Using Low-Carbon-Footprint Materials".

Organised By :
Civil and Structural Engineering Technical Division, IEM

Webinar Details

26th Sept 2025, Friday
3.00pm - 5.00pm

Virtual Platform
Zoom

presenter

Prof. Ir. Dr.
U. Johnson Alengaram

Registration Fees
IEM Students : Free
IEM Members : RM 15
Non-IEM Members : RM70
BEM APPROVED CPD/PDP HOURS : 2 REF NO. : Applying

www.myiem.org.my roselein@iem.org.my

Synopsis

'Geopolymer' is an innovative cement-free material that uses a few industrial by-products as the whole cement replacement material. In this innovative construction of a geopolymer concrete house for the Universiti Malaya bus drivers, locally available materials such as Fly ash (FA), Ground granulated blast furnace slag (GGBS), and Palm oil fuel ash (POFA) were used as binders; these binders were activated using alkali activators. M-sand (Manufactured sand) was used to replace conventional mining or river sand. Palm oil clinker (POC), and steel slag aggregates (SSA) were used to replace conventional coarse aggregates. The primary objective of this research is to provide a viable alternative materials and technology using locally available sustainable materials for the whole replacement of cement, sand, and coarse aggregates. The prefabricated modules for wall panels, bricks, blocks, etc., were envisaged by replacing conventional construction materials using agro/industrial by-products. It is envisioned that the cementless concrete products and the demonstration of the geopolymer house constructed using sustainable materials would provide insight to the developers, contractors, the public, students, academics, and researchers. Grade 40 geopolymer concrete was used for the cast-in-situ concrete in columns and beams. The use of an Industrial Building System (IBS) by a unique interlocking system of wall panels is one of the salient points of the project. The development of Universiti Malaya Blocks (UMB) for interior walls is an important aspect of this project. Further, POC as coarse aggregates, a lightweight palm oil waste product, has reduced the weight of the concrete and the UMB. Another prominent aspect is using recycled plastic aggregates in the geopolymer concrete pavement on all three sides of the house.

Speaker's Biodata

Professor Ir. Dr U. Johnson Alengaram is the Director of the Centre for Innovative Construction Technology (CICT), a Research Centre under the Faculty of Engineering, University of Malaya, Kuala Lumpur, Malaysia. He is listed among the top 2% world's scientists by Stanford University through Elsevier Data Repository, and the recipient of outstanding achievement awards in most of the Institutions he served. His research collaboration with multiple national and international companies brought immense benefits to companies and universities as the consultancy projects had practical implications for implementation in construction projects.

He is a Chartered Civil Engineer of the world-renowned Institution of Civil Engineers (ICE, UK) and the Engineering Council (UK); in addition, he is also a qualified Professional Engineer with the Board of Engineers Malaysia. He is a Companion member of the Institution of Engineer Malaysia (CIEM), and a life member of the Concrete Society of Malaysia (CSM).

Professor Ir. Dr U. Johnson Alengaram has supervised 32 research candidates including Doctoral (PhD) and Master of Engineering Science by research mode (MEng Sci.) to graduation. In, addition, he has a number of patents and two copyrights for his inventions. He has been in academia, consultancy, research, and administration and has contributed to society in different capacities in India, Bahrain, and Malaysia. His current Web of Science (WoS) h-index stands at 56, Scopus h-index of 60 and Google Scholar h-index of 69 with the publication of over 200 articles in refereed journals in Web of Science and Scopus indexed journals.