



UNIVERSITI
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BUILDCON2023

**COMPILATION OF PROJECT INNOVATION IDEAS
SEMESTER MARCH – AUGUST 2023**

EMBRACING SMART CONSTRUCTION TRANSFORMATION

BUILDERS' CONVENTION DAY 2023

**Department of Built Environment Studies and Technology
College of Built Environment
Universiti Teknologi MARA Perak Branch**

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Organised by
Department of Built Environment Studies and Technology
College of Built Environment
Universiti Teknologi MARA Perak Branch
Malaysia

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FLY ASH AS SUPPLEMENTARY CEMENTITIOUS MATERIAL REINFORCED CONCRETE BLOCK

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Fly Ash As Supplementary Cementitious Material Reinforced Concrete Block

Innovation Idea:

The largest environmental issue with cement and concrete production is energy usage. According to the National Ready Mixed Concrete Association, 0.9 pounds of carbon dioxide are released for every pound of concrete. Due to the growing use of concrete, the industry's carbon dioxide emissions are constantly rising. All coal combustion power plants produce unused fly ash and bottom ash, which lead to environmental problems such as air pollution and groundwater contamination. This is primarily due to the leaching of metals from the ashes, with a significant concern being the accumulation of fine particles in fly ash. Cement replacements such as Pulverised Fuel Ash (PFA) and Ground Granulated Blast-furnace Slag (GGBS) can save 850 kg of carbon dioxide for every tonne of Portland cement replaced. Fly ash is also recognised as an environmentally friendly material because it is a byproduct and has low embodied energy. This study was conducted to reduce the reliance on cement in manufacturing concrete blocks by replacing it with fly ash waste. Fly ash, produced during coal combustion for energy, is an industrial by-product which is recognised as an environmental pollutant. The inclusion of fly ash in concrete provides several environmental benefits and improves concrete properties such as workability, compressive strength, and durability. Due to the environmental problems associated with fly ash, considerable research has been undertaken on this subject worldwide. The grade assigned to this fly ash concrete block is grade 20. This study will conduct UPV, density, and compressive strength test. Experimental results show that adding fly ash in the concrete blocks mixture based on the weight of cement can increase the block's strength.

Surat kami : 700-KPK (PRP.UP.1/20/1)

Tarikh : 20 Januari 2023

Prof. Madya Dr. Nur Hisham Ibrahim
Rektor
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Sekian, terima kasih.

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Saya yang menjalankan amanah,

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