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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
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PROPERTIES OF CONCRETE WITH THE PERSONAL PROTECTIVE EQUIPMENT (PPE) WASTE

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Properties Of Concrete With The Personal Protective Equipment (PPE) Waste

Innovation Idea:

A large amount of Personal Protective Equipment (PPE) has been used and subsequently discarded, resulting in an ecological impact during the COVID-19 era. The PPE, being made from plastic, will not decompose for hundreds of years, potentially leading to a global health crisis. As a result, this crisis could affect the world's population, economy, and overall sustainability. This study aims to: 1) explore the reuse of PPE by incorporating it with concrete and investigate its mechanical properties (i.e., compressive strength, quality of concrete, and water absorption), 2) demonstrate the performance of PPE concrete, and 3) determine the marketability prospect of PPE concrete. A series of experiments were conducted, including a compressive test, ultrasonic pulse velocity test at various curing times (7, 14, and 28 days), and water absorption test (28 days). The results indicated that the incorporation of PPE in the concrete enhances its mechanical properties, specifically the maximum compressive strength. Additionally, the ultrasonic pulse velocity with the inclusion of PPE showed an increase compared to the control group. While the additional water absorption of the PPE leads to an increased water demand, it subsequently results in increased levels of porosity and reduced workability. As a result, the incorporation of PPE into concrete materials not only improves concrete mechanics, but also enhances the overall quality, reduces environmental impact (i.e., PPE wastage), and increases market potential.

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