

Precast Rubberized Lightweight Concrete Panel as Thermal and Sound Insulating Construction Material

RESEARCH INSTITUTION **Universiti Tunku Abdul Rahman (UTAR)**

INDUSTRY COLLABORATOR **Acre Works Sdn Bhd**

DATE OF COMPLETION **October 2022**

PROJECT DURATION **53 months (including 17 months of extension due to MCO)**

MRC GRANT APPROVED **RM171,887**

PROJECT OUTPUT **Mix Proportion of Lightweight Concrete Incorporated with Crumb Rubber**

To encourage sustainable and energy-efficient buildings, passive design for cooling and insulation in a building is required which can be achieved through relevant architecture and building design. However, a more practical way that can be easily acceptable for small and medium-scale projects to increase a building's energy efficiency is by using energy-efficient construction material. For this purpose, Universiti Tunku Abdul Rahman (UTAR) and Acre Works Sdn Bhd have collaborated to conduct a research project on incorporating crumb rubber sourced from rubber industry waste into precast concrete wall panel which is then sandwiched between magnesium oxide board.



Due to the lightweight nature of crumb rubber, it has the potential to absorb sound and heat passing through it, particularly when used as part of concrete wall panel which is usually exposed to sound and heat sources. The wall panel produced depicted exceptional fire resistance and thermal insulating properties, thus enhancing its energy efficiency. Moreover, it has good acoustic insulation with an average sound reduction recorded is by 43 Db. At the same time, the wall panel also meets the minimum strength requirement for a non-load bearing system. In terms of sustainability, the precast concrete panel incorporated with crumb rubber promotes the reuse of waste rubber material through recycling and reusing hence, lessening the environmental burdens on waste products disposal.



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