EXPERIMENTAL INVESTIGATION ON LATEX MODIFIED CONCRETE FOR CIVIL ENGINEERING DEVELOPMENT

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Bachelor of Engineering (Hons) Civil (Infrastructure)
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By
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DECLARATION BY THE CANDIDATE

I declare that the work in this thesis was carried out accordance with the regulation of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledge as referenced work. This topic has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulation for Under Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

Latex modified concrete is a concrete which is weak in tension, inherently brittle and has low ductility incorporating with polymeric materials to enhance the energy absorption capability, impart ductility and strain increase at peak load. Malaysia is one of a country that always has been hit by catastrophic that may affecting the infrastructure. Therefore, the study of the concrete mix design with addition of polymer is done. The objectives of this study are to propose suitable reference of latex modified concrete in infrastructure element and to evaluate the mechanical strength and quality of latex modified concrete with different latex content. Natural Rubber Latex (NRL) in liquid form is added into the concrete by latex/water ratio with different percentage varies from 0% to 20% until it homogeneously mixed. Cubes were decided to be tested with cube compression test and Ultrasonic Pulse Velocity (UPV) Test while cylinders were tested with cylinder tensile test. The latex modified concrete were designed to achieved the target strength of 30MPa. It was found that the concrete with 10% latex content has the highest compressive strength achieved among other latex modified concrete where the strength gained is 34.25MPa which is slight lower than normal concrete. It can be seen that the higher the latex content, the lower the compressive strength achieved. Furthermore, the tensile test shows that the value of tensile strength is getting lower with increasing latex content. However, UPV test proved that the higher the NRL content, the higher the velocity of concrete thus make the concrete in a high integrity. It can be concluded that 10% is the optimum value of NRL that can be added into the concrete mix as it has achieved the desired strength of 30MPa and has high integrity of concrete.

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