

## Surface resistivity and ultrasonic pulse velocity evaluation of reinforced OPC concrete and reinforced geopolymer concrete in marine environment

*M. B. H. Ab Manaf<sup>1</sup>, Z. Yahya<sup>2</sup>, R. Abd Razak<sup>2</sup>, A. M. Mustafa Al Bakri<sup>4</sup>, N. F. Ariffin<sup>3</sup>,  
M. M. Ahmad<sup>2</sup>, Y. C. Chong<sup>2</sup>*

<sup>1</sup> School of Environmental Engineering, Universiti Malaysia Perlis, Arau, Malaysia

<sup>2</sup> Department of Civil Engineering Technology, Faculty of Engineering Technology, Universiti Malaysia Perlis, Perlis, Malaysia

<sup>3</sup> Faculty of Civil Engineering and Earth Resources, Universiti Malaysia Pahang, Gambang, Malaysia

<sup>4</sup> Green Design and Manufacture Research Group, Center of Excellence Geopolymer and Green Technology (CEGeoGTech), Universiti Malaysia Perlis, Kangar, Malaysia

### ABSTRACT

The concrete structures that are built along the seaside often suffer from reduced service life due to inadequate durability against deterioration. This research reports the findings of concrete resistivity and quality using two Non-Destructive Testing (NDT) measures applied to Reinforced Geopolymer and Ordinary Portland Cement (OPC) concrete in the marine environment. In addition, the relationship between Reinforced Geopolymer and Reinforced OPC concrete was statistically discussed in-terms of strength and direction. The testing was carried out using a Proceeq Resipod Wenner 4-probe to measure Surface Resistivity (SR) and Ultrasonic Pulse Velocity (UPV), respectively. The testings were carried out on beam shaped samples of OPC and Geopolymer concrete that were immersed in seawater over a period of 90 days with similar curing condition. It was found from the present investigation that the maximum SR and maximum UPV values acquired for both the Reinforced OPC and Reinforced Geopolymer concrete are 2.73 kΩcm and 2.07 kΩcm, as well as 4.18 km/s and 4.05 km/s, respectively. It is apparent from the study that both concrete is comparable in terms of quality and surface resistivity.

### KEYWORDS

Reinforced concrete; Geopolymer concrete; Surface resistivity; Ultrasonic pulse velocity; Non-destructive test; Marine environment; Correlation; Relationship

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