

# Mechanical performance of carbon fiber reinforced polymer as repair material for damage wall structure

*J Izwan <sup>1</sup>, I Md Sayuti <sup>1</sup>, I R Noram <sup>2</sup>, O M Md Azree <sup>3</sup> and F S Syahrul <sup>4</sup>*

1 School of Civil Engineering, Engineering Campus,  
Universiti Sains Malaysia, Penang, Malaysia

2 Faculty of Civil Engineering & Earth Resources,  
Universiti Malaysia Pahang, Pahang, Malaysia

3 School of Housing, Building and Planning, Universiti Sains Malaysia,  
Penang, Malaysia

4 Faculty of Civil Engineering, Universiti Teknologi MARA Pulau Pinang,  
13500 Permatang Pauh, Penang, Malaysia

[ceizwan@usm.my](mailto:ceizwan@usm.my)

## **ABSTRACT:**

The quality of fired clay brick from different factory varies due to the different method of a manufacturing process. This research was design into three stages which are i) characteristic material study, where the material sources was from 3 states in Malaysia (Sidam Kiri Kedah, Serendah Selangor and Beruas Perak), ii) wall performance before retrofit and iii) damage wall performance after retrofitting process using CFRP. Based on the result obtained, the engineering properties of fired clay brick from Serendah Selangor shows the highest value of compressive strength as compared to brick from the other states. It has the higher flexural strength, low value of IRA, low value of water absorption, and low value of porosity. For the wall performance, the result show that the CFRP horizontal pattern for brickwall made from Serendah Selangor was better than oher types Beruas Perak and Sidam Kiri Kedah with percentage of increment 76%, 22% and 1.9% respectively, after being repair with CFRP. As for conclusion, the strength of brick wall can be improved significantly with the application of using CFRP strip in the research.

**Keyword:** Carbon fiber; Reinforced polymer; Wall structure