

Experimental Study of the Bond Strength Between GFRP Reinforcement and Concrete

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This study aims to evaluate and compare the bond strength between Glass Fiber Reinforced Polymer (GFRP) reinforcement and conventional steel rebar in concrete. Experimental tests were conducted using the pull-out and flexural bonding methods based on ACI and SNI standards. GFRP was selected due to its corrosion resistance and lightweight properties, making it ideal for harsh environments such as the coastal region of Bengkalis. Concrete with a compressive strength of f'_c 25 MPa was tested at 28 days of age using bond lengths of 5db, 10db, and 15db. The results show that although steel rebar has higher tensile strength, GFRP demonstrated competitive bond performance, particularly in aggressive environments. Observed failure patterns included pull-out failure and concrete splitting for both types of reinforcement. This research is expected to serve as a reference for designing corrosion-resistant and environmentally friendly reinforced concrete structures.

Keywords: GFRP, bond strength, pull-out test, flexural bonding, reinforced concrete, coastal.