

The Flexural Improvement of RC Beams Using an Inserted Plate between Concrete and FRP Bonding Surface

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Abstract : The primary objective of this research is to improve the flexural capacity of FRP strengthened RC Beam structures with Aluminum and Titanium laminates. FRP rupture of flexural strengthened RC beams using FRP plates generally occurs at the interface between FRP plate and the beam. Therefore, in order to prevent brittle rupture and improve the ductility of the system, this research was performed by using Aluminum and Titanium materials between the two different structural systems. The research also aims to provide various strengthening/retrofitting methods for RC beam structures and to conduct a preliminary analysis of the demands on the structural systems. This was achieved by estimation using the experimental data from this research to identify a flexural capacity for the systems. Ultimately, the preliminary analysis of current study showed that the flexural capacity and system demand ductility was significantly improved by the systems inserted with Aluminum and Titanium anchor plates. Further verification of the experimental research is currently on its way to develop a new or reliable design guideline to retrofit/strengthen the concrete-FRP structural system can be evaluated.

Keywords : reinforced concrete, FRP laminate, flexural capacity, ductility

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