

Thesis title:

Thermo-mechanical behaviour of insulated FRP/Concrete composites at elevated temperature.

Abstract:

The Fiber-reinforced polymer (FRP) retrofitting technique has become an efficient method for retrofitting concrete structures, especially in buildings and bridges. Though FRP has superior mechanical properties, the fire performance of FRP/Epoxy composites remains an obstacle for practical applications. Though the application of insulation layers has become a generic solution for FRP strengthened infrastructures, the currently available insulation systems are not affordable due to the high cost of the materials and larger thickness requirements.

This study focuses on providing cost-effective solutions to improve the fire performance of CFRP/Concrete composites. In such a case, developing cost-effective insulation using locally available materials, discovering alternative FRP/Concrete bond arrangements for enhanced thermal performance, and delaying the glass transient temperature of epoxy adhesive are the strategies currently explored. This study is based on both laboratory experiments and numerical modeling using advanced finite element packages.