



Renewing Short-Span Existing Bridge Decks with CFRP Tendons for Durability

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Abstract

Many short span bridges have sound substructures, but their superstructures have deteriorated and often have seismic performance problems. Considering factors such as the aging population, declining population, and financial constraints within the local communities, it is crucial for such bridge replacements to adopt "Smart Structures", such as maintenance-free structures. Therefore, this research was being conducted on precast PC (prestressed concrete) decks using carbon fiber reinforced polymer (CFRP), which are corrosion-resistant and can reduce maintenance costs. The Result showed that thin-walled PC decks with CFRP also had an same effective anchorage length for conventional standard PC steel strand wire. And, based on numerical analysis and loading tests, it was confirmed that the bending load carrying capacity of PC decks can be evaluated using the current design method.

Keywords: carbon fiber; CFRP; PC deck; short span bridge; maintenance free; finite element method.