عنوان مقاله:

Reliability Analysis of Available Stress Models for FRP Confined Rectangular Concrete Columns

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خلاصه مقاله:

Using fiber reinforced polymers (FRP) in engineering applications has grown rapidly in the past decades due to their desirable mechanical properties such as high tensile strength and corrosion resistance. One of these applications is to wrap FRP sheets around the concrete columns for strengthening and rehabilitation. Many investigations are performed in this field and various relations are proposed to predict ultimate stress of FRP confined concrete columns. Most of these models are developed for circular columns, because the previous researches and experiences demonstrated that the confinement effect of FRP wraps in circular sections is more than the rectangular ones. This is due to non -uniform distribution of confinement pressure in rectangular sections. The main goal of this paper is to perform a reliability analysis on the available stress models for FRP confined rectangular concrete columns. For this purpose, after a brief review of the existing relations, accuracy and reliability of the reviewed models is investigated based on a database of experimental results collected from previous researches. In this process, the Monte Carlo simulation technique will be used to produce sample data necessary for calculation of uncertainty index. A novel efficiency index is defined for comparing performance of different models. Based on the obtained results, the reviewed methods are ranked according to their accuracy and reliability

کلمات کلیدی:

.Reliability analysis, Stress Model, Strain Model, FRP Confined Concrete Column, Rectangular section