

عنوان مقاله:

Numerical investigation of crack direction and amount in CFRP-reinforced concrete flexural frame

محل انتشار:

هشتمین کنگره سالانه بین المللی عمران، معماری و توسعه شهری (سال: 1401)

تعداد صفحات اصل مقاله: 17

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خلاصه مقاله:

In general, many of the existing buildings need some retrofitting methods due to inappropriate conditions at the time of construction, change of use, or design mistakes. In the last few decades, strengthening concrete frames with new and innovative materials is considered one of the retrofitting techniques. This is while the behavior of concrete frames covered with CFRP carbon polymer fibers is less well known. In this article, reinforced concrete frames with one opening and two floors are modeled and subjected to lateral displacement as static loading and then under Seismic loading is applied. The main purpose of this article is to investigate and analyze the effect of crack direction on the fatigue behavior of reinforcing fibers using the finite element method in concrete frames. The results show that reinforced frames, during both types of loading, have a high stiffness up to the yield displacement, but after this limit, the lateral resistance of this reinforced system suddenly decreases. The comparison of the load-bearing and shear hysteresis curves of the base of the frames shows that the fibers with an all-over arrangement play a significant role in increasing the hardness and finally the lateral resistance of the mentioned frames during both types of loading. By covering reinforced concrete columns with fibers, the concentration of distribution and the number of plastic strains and cracks in the columns are reduced, and it is a sign of the proper performance of CFRP fibers in reducing the concentration of distribution and the number of cracks and improving the cyclic lateral behavior of the frames.

کلمات کلیدی:

strengthening, CFRP fibers, finite elements, dynamic loading

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<https://civilica.com/doc/1655780>

