عنوان مقاله:

Numerical study of the effect of FRP sheets on the cyclic behavior of concrete columns exposed to fire

محل انتشار:

مجله آنالیز غیر خطی و کاربردها, دوره 14, شماره 12 (سال: 1402)

تعداد صفحات اصل مقاله: 11

نویسندگان:

Seyed Amir Hashemi Amiri - Department of Civil Engineering Qaemshahr Branch, Islamic Azad University, Qaemshahr, Iran

Gholamreza Ghodrati Amiri - Department of Civil Engineering Qaemshahr Branch, Islamic Azad University, Qaemshahr, Iran

Maysam Ghasemi Naghibdehi - Department of Civil Engineering Qaemshahr Branch, Islamic Azad University, Qaemshahr, Iran

Mobin Afzalirad - Department of Civil Engineering Qaemshahr Branch, Islamic Azad University, Qaemshahr, Iran

خلاصه مقاله:

Despite the widespread and successful use of FRP sheets in improving the seismic behavior of structures, the effect of FRP sheets on the strength of structural members under lateral load (such as concrete columns), especially at high temperatures, has received less attention. Therefore, in this study, while making sure the accuracy of numerical simulations, then, by numerical modeling of three-dimensional finite element columns of reinforced concrete columns in both non-reinforced and reinforced conditions with CFRP sheets and thermal coupling-displacement analysis of this model during cyclic lateral loading at different fire temperatures, the effect of reinforcement of reinforced concrete columns with FRP sheets on the cyclic lateral behavior of these columns at different fire temperatures has been investigated. From the results of these studies, It has been observed that following the increase of fire temperature from ۲۵۰ to ۱۰۰۰ ˚C in both reinforced concrete columns and reinforced with FRP sheets, on the amount of lateral force, anchorage and energy of these columns during lateral loading of the cycle, the amount of lateral force, anchorage and energy of these columns during cyclic lateral bearing has been increased, which this increase (as the result of the increase in fire temperature) of the mentioned responses in the columns is more significant than the temperature of ۵۰۰ ˚C and especially in the reinforced concrete columns reinforced with FRP sheets.

کلمات کلیدی:

Reinforced Concrete Column, FRP sheets, Fire heat, Cyclic loading, finite element method, Abaqus software