

Estimation of the residual stiffness of fire-damaged concrete members

Zhu Jianming, Wang XiChun, Wei Dong, Liu Yinghua, XU Bingye

Summary

The residual stiffness of concrete member after fire is a very important parameter of the load-bearing ability and seismic performance of fire-damaged concrete structures. It is also one of the most important criteria for repairing and reinforcing the fire-damaged concrete structures. Based on the equivalent elastic modulus method, improved segment model method and parameter inversion method developed in this paper, the residual stiffness of concrete members exposed to standard fire is calculated and the effects of fire duration, steel ratio and section size on the stiffness are also presented in detail. The results show that these three methods can easily and effectively estimate the residual stiffness of fire-damaged concrete members. These methods and their findings can be useful for designing and assessing the fire resistance of concrete structures.

