

## Assessing the Fire Resistance of Earthquake Damaged Structures

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### Introduction:

Fire is an extremely complex phenomenon that is responsible for loss of human life and considerable property and environmental damages every year around the world[1]. In regions of the world where there is a significant risk to structures from earthquakes, engineers also ensure that structures possess adequate resistance to the additional forces generated by earthquakes. The primary purpose of the project is to investigate the mechanics of the response of earthquake damaged structures (primarily reinforced concrete frames) subjected to fire (through small and large scale testing and developing computational models).

### Methodology:

- Developing subroutines for the soft ware OPENSEES[2], so that it can be used for structural analysis for fire loading;
- Modelling the experiment on the fire resistance of an earthquake damaged structure as described below using upgraded OPENSEES;
- Participating in the experiment on the fire resistance of the earthquake damaged structure(Fig.1)to be carried out at IIT Roorkee(India), and comparing the results with the modelling results.

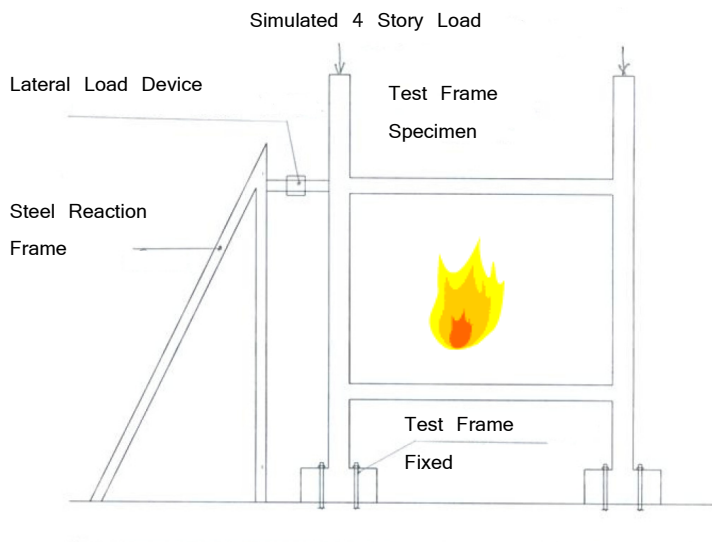


Fig.1 Experimental Model of the Fire Resistance of Earthquake Damaged Structure

### Experiment:

A 4 storey [G+3] RCC frame building has been designed as per the relevant Indian Codes. One central ground storey bay of the building frame is being considered for testing. To simulate post earthquake fire loading, the frame shall be loaded laterally to induce damage which shall be followed by fire test.

### References and Notes:

- [1] R. Viskanta, *International Journal of Thermal Sciences* Vol. 47, 12, 2008, 1563-1570.
- [2] <http://opensees.berkeley.edu/index.php>

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