



COLLAPSE BEHAVIOR OF RCC BUILDING FRAME WITH AND WITHOUT SHEAR WALL

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Abstract: Progressive collapse is generally defined as small or local structural failure results in damage and failure of the adjoining members and in turn, causing total collapse of the building or a disproportionately large part of it. This investigation deals with the effect of progressive collapse behaviour of G+3 RCC building frame with and without shear wall. Progressive collapse of building structures is initiated by loss of one or more vertical load carrying members, usually columns. If the neighbouring elements are not designed to resist the redistributed loads, failure will happen with further load redistribution until equilibrium is reached, resulting in partial or total collapse of the structure. The study includes the investigation of critical columns for a 4 storey RCC building with and without shear wall. The height of building is 3.2m at each floor. The behavioural changes investigated, under critical load path of the building subjected to a sudden collapse of load bearing member. This RCC building is designed as per relevant Indian codes and investigation is carried out considering the load path where maximum behavioural changes occur in terms of displacement, vertical reaction and axial forces after removal of load bearing member due to progressive collapse. The numerical investigation is carried out using commercially available software STAAD Pro. It is observed that ground floor columns are most critical for load transfer and joint displacement when subjected to progressive collapse.

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1. INTRODUCTION

Prevention or mitigation of progressive collapse appears to be an important issue in the development of several structural design codes. They highlight the necessity of providing