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Effect of Blast Loads on the Seismically Designed Reinforced Concrete Buildings

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Abstract : The work done here in this paper is dedicated to studying the effect of high blast explosives over the seismically designed buildings. Buildings are seismically designed in SAP 2000 software to simulate seismic designs of buildings using response spectrum method. Later these buildings have been studied applying blast loads with the same amount of the blast explosives. This involved varying the standoff distances of the buildings from the blast explosion. The study found out that, for a seismically designed building, the minimum standoff distance is to be at least 120m from the place of explosion for an average blast explosive weight of 20kg TNT. This has shown that the building does not fail due to this huge explosive weight of TNT but resists immediate collapse of the building. The results also show that the adverse effect of the column failure due to blasting is reduced to 73.75% from 22.5% due to the increase of the standoff distance from the blast loads. The maximum affected locations due to the blast loads are also detected in this study.

Keywords : blast loads, seismically designed buildings, standoff distance, reinforced concrete buildings
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