

Damage Assessment of Reinforced Concrete Slabs Subjected to Blast Loading

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Abstract : A numerical investigation has been carried out to examine the behaviour of reinforced concrete slabs to uniform blast loading. The aim of this work is to determine the effects of various parameters on the results. Finite element simulations were performed in the non linear dynamic range using an elasto-plastic damage model. The main parameters considered are: the negative phase of blast loading, time duration, equivalent weight of TNT, distance of the explosive and slab dimensions. Numerical modelling has been performed using ABAQUS/Explicit. The results obtained in terms of displacements and propagation of damage show that the above parameters influence considerably the nonlinear dynamic behaviour of reinforced concrete slabs under uniform blast loading.

Keywords : blast loading, reinforced concrete slabs, elasto-plastic damage model, negative phase, time duration, equivalent weight of TNT, explosive distance, slab dimensions

Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development

Conference Location : Chicago, United States

Conference Dates : December 12-13, 2020