World Academy of Science, Engineering and Technology
International Journal of Civil and Architectural Engineering
Vol:9, No:09, 2015

Numerical Analysis of Dynamic Responses of the Plate Subjected to Impulsive Loads

Authors : Behzad Mohammadzadeh, Huyk Chun Noh

Abstract : The plate is one of the popular structural elements used in a wide range of industries and structures. They may be subjected to blast loads during explosion events, missile attacks or aircraft attacks. This study is to investigate dynamic responses of the rectangular plate subjected to explosive loads. The effects of material properties and plate thickness on responses of the plate are to be investigated. The compressive pressure is applied to the surface of the plate. Different amounts of thickness in the range from 10mm to 30mm are considered for the plate to evaluate the changes in responses of the plate with respect to the plate thickness. Two different properties are considered for the steel. First, the analysis is performed by considering only the elastic-plastic properties for the steel plate. Later on damping is considered to investigate its effects on the responses of the plate. To do analysis, the numerical method using a finite element based package ABAQUS is applied. Finally, dynamic responses and graphs showing the relation between maximum displacement of the plate and aim parameters are provided.

Keywords : impulsive loaded plates, dynamic analysis, ABAQUS, material nonlinearity
Conference Title : ICACE 2015 : International Conference on Architectural and Civil Engineering
Conference Location : Los Angeles, United States
Conference Dates : September 28-29, 2015