ABSTRAK

DYNAMIC RESPONS OF PLATES DUE TO POSITIVE AND NEGATIVE PHASE OF LOCALIZED BLAST LOAD

by

ARYS ANDHIKATAMA

***Student Number*: 327171009**

(Master Degree Program of Civil Engineering)

Localized blast loadings are often overlooked during the structural system design process despite their potential detrimental effects. These forces are unique and often generate irregular responses on structural slab constructions and may require certain attention. In this research, a set of slab models with semi-rigid boundary conditions on its sides and with variations in thicknes are subjected to two models of localized blast loading at certain locations. Localized blast loadings are modeled as blast load with linier function and blast load with linier function and cubic negative. The main system responses that are observed are the transversal deflections at midspan and the internal stresses of the system, particularly the maximum principle stress and minimum principle stress. Four loading phases are included in the analysis, namely: the positive phase, the zero phase, the negative phase, and the free vibration phase. Analyses are carried out utilizing a numeric approach termed the Modified Bolotin Method. Deflections resulting from various load positions on the set of slab models and loads function are then compared side-by-side. Stresses are calculated on all slab models with the localized blast loading applied at midspan and the results are presented as stress contours that are then compared between each model. Based on the results from this research, additional plate thickness can reduce plate deflection. The location of blast load also affect the value of plate deflection in the mid span. The maximum and minimum principle stress also reduced by the addition of plate thickness.

Keywords: *Localized blast load, Thickness, Modified Bolotin Method, principle stress*