Translational and Rotational Effect of Earthquake Ground Motion on a Bridge Substructure

Authors : Tauhidur Rahman, Gitartha Kalita

Abstract : In this study a four span box girder bridge is considered and effect of the rotational and translational earthquake ground motion have been thoroughly investigated. This study is motivated by the fact that in many countries the translational and rotational components of earthquake ground motion, especially rocking, is not adequately considered in analysing the overall response of the structures subjected to earthquake ground excitations. Much consideration is given to only the horizontal components of the earthquake ground motion during the response analysis of structures. In the present research work, P waves, SV waves and Rayleigh wave excitations are considered for different angle of incidence. In the present paper, the four span bridge is model considering the effects of vertical and rocking components of P, SV and Rayleigh wave excitations. Ground responses namely displacement, velocity and acceleration of the substructures of the bridge have been considered for rotational and translational effects in addition to the horizontal ground motion due to earthquake and wind. **Keywords :** ground motion, response, rotational effects, translational effects

Conference Title : ICACSE 2015 : International Conference on Architectural, Civil and Structural Engineering

Conference Location : Zurich, Switzerland **Conference Dates :** July 29-30, 2015