World Academy of Science, Engineering and Technology
International Journal of Geotechnical and Geological Engineering
Vol:9, No:07, 2015

Dynamic Soil-Structure Interaction Analysis of Reinforced Concrete Buildings

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Abstract : The objective of this paper is to evaluate the effects of soil-structure interaction (SSI) on the modal characteristics and on the dynamic response of current structures. The objective is on the overall behaviour of a real structure of five storeys reinforced concrete (R/C) building typically encountered in Algeria. Sensitivity studies are undertaken in order to study the effects of frequency content of the input motion, frequency of the soil-structure system, rigidity and depth of the soil layer on the dynamic response of such structures. This investigation indicated that the rigidity of the soil layer is the predominant factor in soil-structure interaction and its increases would definitely reduce the deformation in the R/C structure. On the other hand, increasing the period of the underlying soil will cause an increase in the lateral displacements at story levels and create irregularity in the distribution of story shears. Possible resonance between the frequency content of the input motion and soil could also play an important role in increasing the structural response.

Keywords : direct method, finite element method, foundation, R/C Frame, soil-structure interaction
Conference Title : ICGCE 2015 : International Conference on Geological and Civil Engineering
Conference Location : Paris, France
Conference Dates : July 20-21, 2015