

## Investigating the Behaviour of Composite Floors (Steel Beams and Concrete Slabs) under Mans Rhythmical Movement

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**Abstract :** Structural engineers have long been trying to develop solutions using the full potential of its composing materials. Therefore, there is no doubt that the structural solution progress is directly related to an increase in materials science knowledge. These efforts in conjunction with up-to-date modern construction techniques have led to an extensive use of composite floors in large span structures. On the other hand, the competitive trends of the world market have long been forcing structural engineers to develop minimum weight and labour cost solutions. A direct consequence of this new design trend is a considerable increase in problems related to unwanted floor vibrations. For this reason, the structural floors systems become vulnerable to excessive vibrations produced by impacts such as human rhythmic activities. The main objective of this paper is to present an analysis methodology for the evaluation of the composite floors human comfort. This procedure takes into account a more realistic loading model developed to incorporate the dynamic effects induced by human walking. The investigated structural models were based on various composite floors, with main spans varying from 5 to 10 m. based on an extensive parametric study the composite floors dynamic response, in terms of peak accelerations, was obtained and compared to the limiting values proposed by several authors and design standards. This strategy was adopted to provide a more realistic evaluation for this type of structure when subjected to vibration due to human walking.

**Keywords :** vibration, resonance, composite floors, people's rhythmic movement, dynamic analysis, Abaqus software

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