

The influence of plasterboard clad walls on the structural behaviour of low rise residential buildings

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ABSTRACT

While the design and technology of conventional low rise light framed residential structures are relatively simple, their response to lateral loading is quite complex. This is due to the high degree of redundancy, the irregular geometry and interaction between the structural and non-structural components. In addition, the designated lateral bracing elements within one structure may exhibit significantly different behaviour due to the different bracing actions and different materials. This paper focuses on the bracing capacity of plasterboard clad walls which could be considered either structural or non-structural. While such walls may be installed purely as partition walls, they may provide lateral strength and stiffness due to the complex load paths. The paper presents in detail the possible load transfer mechanisms to a variety of typical walls. It also highlights the difficulty with performing racking tests on isolated walls due to the complex boundary conditions surrounding walls in real structures. In addition, the paper reports racking test results that demonstrate the effects of different boundary conditions on the load carrying capacity and the failure modes.

KEYWORDS

Residential, lateral bracing, load sharing, plasterboard, light framed walls.
