

Dynamic Thermal Analysis of Masonry Wall Systems

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Abstract:

Current energy costs and a need for conservation require more accurate thermal analysis techniques. The dynamic thermal performance of masonry walls was studied utilizing NBSLD, a dynamic thermal analysis computer program based on the response factor method. Five wall sections were analyzed for their response to outside temperature changes and heat flow. Comparisons are made between masonry and wood frame walls and the inside out construction details. It has been shown that masonry performs from 5% to 50% better, thermally, than steady state calculations estimate due to high heat capacity, mass and density. Also, using steady state analysis of masonry walls can lead to oversized heating systems which can result in higher initial heating costs and higher monthly fuel bills.

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