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ASSESSMENT OF WALLS' THERMAL RESPONSE FROM A PROPORTIONAL AND A RELATIVE POINT OF VIEW

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ABSTRACT

In this work the variations of concrete thermophysical properties for various wall configurations are considered to assess their influence on the dynamic thermal characteristics, such as the decrement factor and time lag. The examined assemblies refer to insulated walls with variable concrete thickness and the concrete placement in one or two layers. The insulation is also placed as one or two equivalent layers (constant thicknesses) giving rise to a total of six representative wall formations. The thermal response is determined by employing the thermal-circuit modelling approach and the analysis is based on the nodal solution method. Variations on the geometrical characteristics and the thermophysical properties of concrete layers are seen to interrelate non-linearly with the walls' *RC* -sections corresponding parameters with consequences on its dynamic thermal characteristics. As such variations, together with the studied insulation placements, affect the decrement factor and time lag in a disparate way, metrics for assessing the walls' thermal behaviour from a proportional (*PDM*, *PTM*) and a relative (*RDM*, *RTM*) viewpoint are introduced. Computer results, revealing the influence of the assumed wall attributes on the decrement factor, time lag and the proposed metrics are shown for all the studied wall assemblies.