

# Transient heat transfer in foundation structure

Milos Kalousek<sup>1)</sup>

<sup>1)</sup>Institute of Building Structures, Faculty of Civil Engineering, Brno University of Technology, 602 00 Brno, Czech Rep., kalousek.m@fce.vutbr.cz

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## Abstract

Evaluation of internal surface temperature at the wall and floor and also temperature inside the soil (non-freezing depth) are usually provided only in steady-state of heat transfer. Soil contains about 10 to 20 % of water and take latent heat (cold) till completely change to solid phase. Is it necessary to take in account in calculation of thermal 2D field? Is there temperature really so low or below zero? How can move calculation respect sensible and latent heat and density of soil and building materials?

Determining of non-freezing depth is by years of experience. Continuously variable depth for loamy sand subsoil is designed for 800 mm and for clay is 1200 mm. A critical construction detail, in terms of lowest surface temperature considered, in only a steady state thermal field simulation. These methods are based on the earlier tradition of assessing the structure only in the steady state, because the real simulation of transient thermal analysis of the construction was not available. Above all, they are erroneously calculated the temperature in the computation of boundary soil conditions (-15 °C) at steady state, which occurs after several weeks of action (during the winter period). It is also not considered to latent heat contained water, which slows down the significance of soil freezing. Posts and includes a comparison of steady state and transient state for real extreme external air temperatures.

## References

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