

Thermo-Hydro-Mechanical Modeling of Landfill Behavior

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Abstract : Municipal solid waste landfills have relatively high temperature which is caused by anaerobic and aerobic degradation. The temperature that is produced is almost 40-70°C. Since this temperature will remain for many years, considering it for studying landfill behavior and its soil is so important. By considering the temperature of landfill, the obtained results will become more logical and more realistic. Vertical displacement and differential settlement are two important values which are studied here. Differential displacements could expand cracks in liner and cover. If cracks appear in the liner, the leachate and gases will propagate to media and hence should be noticed carefully. The present research is focused on the thermo-hydro-mechanical modeling of landfill with finite element method. First, the heat transfer of the landfill is modeled and the temperature is estimated. Then, the results of thermo-hydro-mechanical results are presented to investigate landfill behavior more accurately.

Keywords : finite element method, heat transfer, landfill behavior, thermo-hydro-mechanical modeling

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