

Sainte Sophie Landfill: Field-Scale Assessment of Municipal Solid Waste Mechanical Characteristics

Authors : Wameed Alghazali, Shawn Kenny, Paul J. Van Geel

Abstract : Settlement of municipal solid waste (MSW) in landfills can be represented by mechanical settlement, which is instantaneous and time-dependent creep components, and biodegradation-induced settlement. Mechanical settlement is governed by the physical characteristics of MSW and the applied overburden pressure. Several research studies used oedometers and different size compression cells to evaluate the primary and mechanical creep compression indices/ratios. However, MSW is known for its heterogeneity, which means data obtained from laboratory testing are not necessary to be a good representation of the mechanical response observed in the field. Furthermore, most of the laboratory tests found in the literature were conducted on shredded samples of MSW to obtain specimens that are suitable for the testing setup. It is believed that shredding MSW samples changes the physical and mechanical properties of the waste. In this study, settlement field data was collected during the filling stage of Ste. Sophie landfill was used to estimate the primary and mechanical creep compression ratios. The field results from Ste. Sophie landfill indicated that both the primary and mechanical creep compression ratios of MSW are not constants but decrease with the increase in the applied vertical stress.

Keywords : mechanical creep compression ratio, municipal solid waste, primary compression ratio, stress level

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